

# Leaded MLCC



#### **EU RoHS Compliant**

- All the products in this catalog comply with EU RoHS.
- EU RoHS is "the European Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment."
- For more details, please refer to our web page, "Murata's Approach for EU RoHS" (<https://www.murata.com/en-eu/support/compliance/rohs>).

# Contents

Product specifications are as of February 2018.

|                                                                       |            |
|-----------------------------------------------------------------------|------------|
| Part Numbering .....                                                  | p2         |
| <hr/>                                                                 |            |
| <b>1</b> <b>Leaded MLCC for Automotive</b>                            |            |
| <b>RCE Series (DC25V-DC1kV) .....</b>                                 | <b>p4</b>  |
| ● Marking .....                                                       | p6         |
| Temperature Compensating Type, C0G/U2J Characteristics .....          | p6         |
| High Dielectric Constant Type, X7R/X7S Characteristics .....          | p13        |
| ● Specifications and Test Methods .....                               | p17        |
| <hr/>                                                                 |            |
| <b>2</b> <b>150°C Operation Leaded MLCC for Automotive</b>            |            |
| <b>RHE Series (DC25V-DC100V) .....</b>                                | <b>p25</b> |
| ● Marking .....                                                       | p26        |
| Temperature Compensating Type, X8G Characteristics .....              | p27        |
| High Dielectric Constant Type, X8L Characteristics .....              | p28        |
| ● Specifications and Test Methods .....                               | p31        |
| <hr/>                                                                 |            |
| <b>3</b> <b>175°C/200°C Operation Leaded MLCC for Automotive</b>      |            |
| <b>RHS Series (DC100V-DC500V) .....</b>                               | <b>p34</b> |
| ● Marking .....                                                       | p35        |
| Temperature Compensating Type, CCG/UNJ Characteristics .....          | p35        |
| High Dielectric Constant Type, XAL/XAN Characteristics .....          | p37        |
| ● Specifications and Test Methods .....                               | p38        |
| <hr/>                                                                 |            |
| <b>4</b> <b>Leaded MLCC for General Purpose</b>                       |            |
| <b>RDE Series (DC25V-DC1kV) .....</b>                                 | <b>p44</b> |
| ● Marking .....                                                       | p45        |
| Temperature Compensating Type, C0G/U2J Characteristics .....          | p45        |
| High Dielectric Constant Type, X7R/X7S Characteristics .....          | p52        |
| ● Specifications and Test Methods .....                               | p56        |
| <hr/>                                                                 |            |
| <b>5</b> <b>Leaded MLCC for General Purpose</b>                       |            |
| <b>RDE Series Large Capacitance and High Allowable Ripple Current</b> |            |
| <b>(DC250V-DC630V) .....</b>                                          | <b>p60</b> |
| ● Marking .....                                                       | p61        |
| High Dielectric Constant Type, X7T Characteristics .....              | p61        |
| ● Specifications and Test Methods .....                               | p63        |
| <hr/>                                                                 |            |
| Characteristics Reference Data (Typical Example) .....                | p66        |
| Packaging .....                                                       | p67        |
| ⚠Caution .....                                                        | p69        |
| Notice .....                                                          | p71        |

Please check the MURATA website (<https://www.murata.com/>) if you cannot find a part number in this catalog.

## ● Part Numbering

### Leaded MLCC

(Part Number)

|    |   |    |    |     |   |   |    |     |   |
|----|---|----|----|-----|---|---|----|-----|---|
| RC | E | R7 | 1H | 104 | K | 0 | M1 | H03 | A |
| ①  | ② | ③  | ④  | ⑤   | ⑥ | ⑦ | ⑧  | ⑨   | ⑩ |

① Product ID

② Series

| Product ID | Series Code |                                                  |
|------------|-------------|--------------------------------------------------|
| RC         | E           | Leaded MLCC for Automotive                       |
| RH         | E           | 150°C Operation Leaded MLCC for Automotive       |
| RH         | S           | 175°C/200°C Operation Leaded MLCC for Automotive |
| RD         | E           | Leaded MLCC for General Purpose                  |

### ③ Temperature Characteristics

| Temperature Characteristic |                 |     | Temperature Characteristics |                   |                                               | Operating Temperature Range |
|----------------------------|-----------------|-----|-----------------------------|-------------------|-----------------------------------------------|-----------------------------|
| Code                       | Public STD Code |     | Reference Temperature       | Temperature Range | Capacitance Change or Temperature Coefficient |                             |
| 5C                         | C0G             | EIA | 25°C                        | 25 to 125°C       | 0±30ppm/°C                                    | -55 to 125°C                |
|                            |                 |     |                             | -55 to 25°C       | 0+30/-72ppm/°C                                |                             |
| 5G                         | X8G             | *1  | 25°C                        | 25 to 150°C       | 0±30ppm/°C                                    | -55 to 150°C                |
|                            |                 |     |                             | -55 to 25°C       | 0+30/-72ppm/°C                                |                             |
| 7G                         | CCG             | *1  | 25°C                        | -55 to 25°C       | 0+30/-72ppm/°C                                | -55 to 200°C                |
|                            |                 |     |                             | 25 to 125°C       | 0±30ppm/°C                                    |                             |
|                            |                 |     |                             | 125 to 200°C      | 0+72/-30ppm/°C                                |                             |
| 7J                         | UNJ             | *1  | 25°C                        | -55 to 25°C       | -750+120/-347ppm/°C                           | -55 to 200°C                |
|                            |                 |     |                             | 25 to 125°C       | -750±120ppm/°C                                |                             |
|                            |                 |     |                             | 125 to 200°C      | -750+347/-120ppm/°C                           |                             |
| 7U                         | U2J             | EIA | 25°C                        | 25 to 125°C*2     | -750±120ppm/°C                                | -55 to 125°C                |
|                            |                 |     |                             | -55 to 25°C       | -750+120/-347ppm/°C                           |                             |
| C7                         | X7S             | EIA | 25°C                        | -55 to 125°C      | ±22%                                          | -55 to 125°C                |
| D7                         | X7T             | EIA | 25°C                        | -55 to 125°C      | +22%, -33%                                    | -55 to 125°C                |
| L1                         | XAL             | *1  | 25°C                        | -55 to 175°C      | +15%, -40%                                    | -55 to 175°C                |
| L8                         | X8L             | *1  | 25°C                        | -55 to 150°C      | +15%, -40%                                    | -55 to 150°C                |
| N1                         | XAN             | *1  | 25°C                        | -55 to 175°C      | +15%, -60%                                    | -55 to 175°C                |
| R7                         | X7R             | EIA | 25°C                        | -55 to 125°C      | ±15%                                          | -55 to 125°C                |

\*1 Murata Temperature Characteristic Code.

\*2 Rated Voltage 100Vdc max: 25 to 85°C

### ④ Rated Voltage

| Code | Rated Voltage |
|------|---------------|
| 1E   | DC25V         |
| 1H   | DC50V         |
| 2A   | DC100V        |
| 2D   | DC200V        |
| 2E   | DC250V        |
| 2W   | DC450V        |
| 2H   | DC500V        |
| 2J   | DC630V        |
| 3A   | DC1kV         |

### ⑥ Capacitance Tolerance

| Code | Capacitance Tolerance |
|------|-----------------------|
| C    | ±0.25pF               |
| D    | ±0.5pF                |
| J    | ±5%                   |
| K    | ±10%                  |
| M    | ±20%                  |

### ⑤ Capacitance

Expressed by three figures. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two numbers.

If there is a decimal point, it is expressed by the capital letter "R."

In this case, all figures are significant digits.

Continued on the following page. ↗

Continued from the preceding page. ➤

⑦ Dimensions (LxW)

| Code     | Dimensions (LxW)  |                                                                      |
|----------|-------------------|----------------------------------------------------------------------|
| <b>0</b> | <b>RCE Series</b> | 3.6×3.5mm max.                                                       |
|          | <b>RHE Series</b> |                                                                      |
|          | <b>RHS Series</b> | 3.8×3.5mm max.                                                       |
|          | <b>RDE Series</b> | 4.0×3.5mm max. or<br>5.0×3.5mm max.<br>(Depends on Part Number List) |
| <b>1</b> | <b>RCE Series</b> | 4.0×3.5mm max.                                                       |
|          | <b>RHE Series</b> |                                                                      |
|          | <b>RHS Series</b> |                                                                      |
|          | <b>RDE Series</b> | 4.5×3.5mm max. or<br>5.0×3.5mm max.<br>(Depends on Part Number List) |
| <b>2</b> |                   | 5.5×4.0mm max.                                                       |
| <b>3</b> |                   | 5.5×5.0mm max.                                                       |
| <b>4</b> |                   | 7.5×5.5mm max.                                                       |
| <b>5</b> |                   | 7.5×7.5mm max.<br>(DC630V, DC1kV : 7.5×8.0mm max.)                   |
| <b>U</b> |                   | 7.5×12.5mm max.<br>(DC630V, DC1kV : 7.5×13.0mm max.)                 |
| <b>W</b> |                   | 5.5×7.5mm max.                                                       |

⑧ Lead Style

| Code         | Lead Style           | Lead Spacing |
|--------------|----------------------|--------------|
| <b>A2</b>    | Straight Long        | 2.5mm        |
| <b>B1</b>    | Straight Long        | 5.0mm        |
| <b>DB/DG</b> | Straight Taping      | 2.5mm        |
| <b>E1</b>    | Straight Taping      | 5.0mm        |
| <b>K1</b>    | Inside Crimp         | 5.0mm        |
| <b>M1/M2</b> | Inside Crimp Taping  | 5.0mm        |
| <b>P1</b>    | Outside Crimp        | 2.5mm        |
| <b>S1</b>    | Outside Crimp Taping | 2.5mm        |

⑨ Individual Specification Code

Expressed by three figures

⑩ Packaging

| Code     | Packaging |
|----------|-----------|
| <b>A</b> | Ammo Pack |
| <b>B</b> | Bulk      |

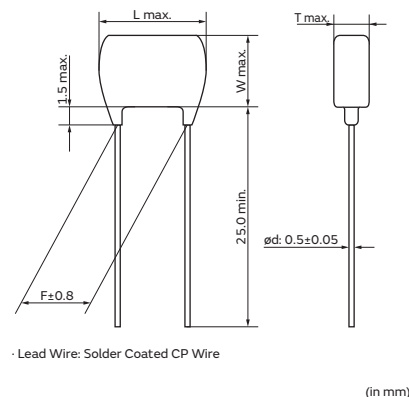
# Leaded MLCC for Automotive

## RCE Series (DC25V-DC1kV)

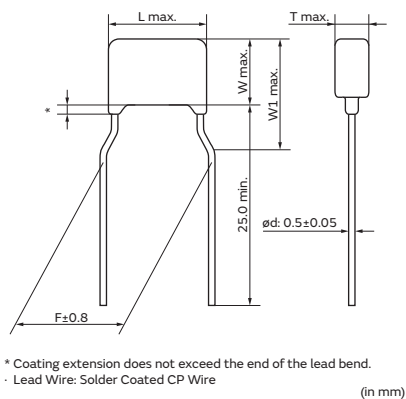
### Features

1. Small size and large capacitance
2. Low ESR and ESL suitable for high frequency
3. Meet AEC-Q200, ISO7637-2 (surge test) requirement
4. Meet LF (Lead Free) and HF (Halogen Free)
5. Flow soldering and welding are available.  
(Re-flow soldering is not available.)
6. If copper wire is necessary at welding process, copper wire is available based on request.

Dimensions code: 0  
Lead style code: A2

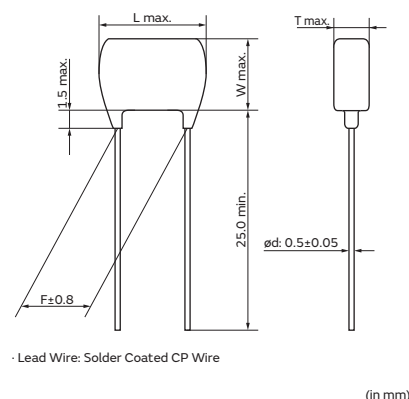


Dimensions code: 0  
Lead style code: K1

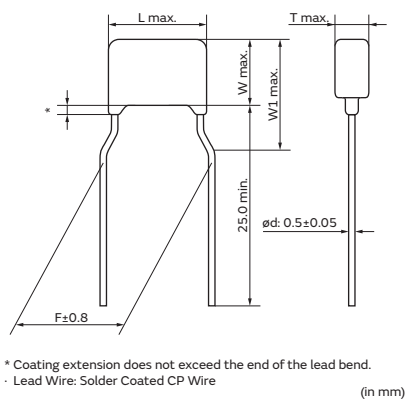


\* Coating extension does not exceed the end of the lead bend.  
• Lead Wire: Solder Coated CP Wire

Dimensions code: 1  
Lead style code: A2

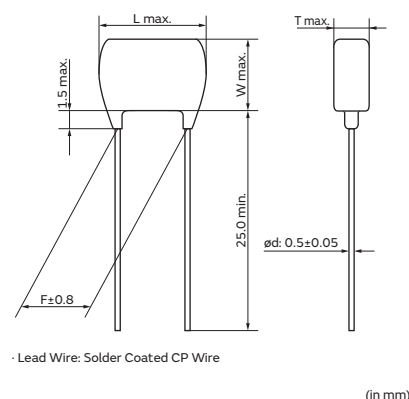


Dimensions code: 1  
Lead style code: K1

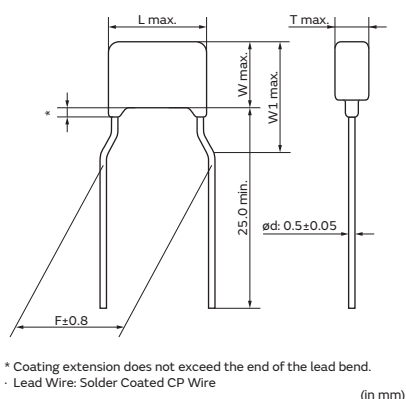


\* Coating extension does not exceed the end of the lead bend.  
• Lead Wire: Solder Coated CP Wire

Dimensions code: 2  
Lead style code: A2

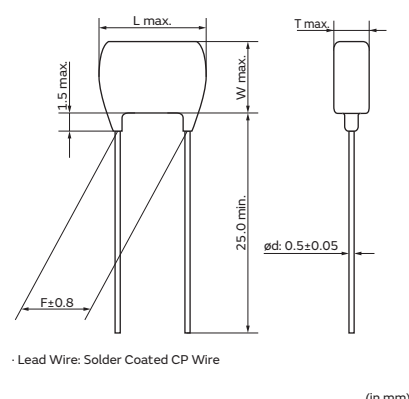


Dimensions code: 2  
Lead style code: K1



\* Coating extension does not exceed the end of the lead bend.  
• Lead Wire: Solder Coated CP Wire

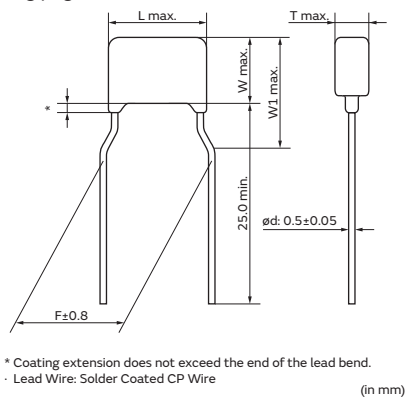
Dimensions code: 3  
Lead style code: A2



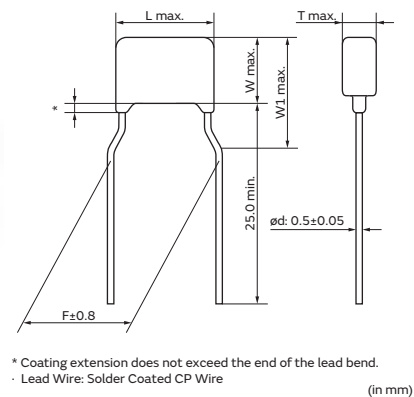
Continued on the following page. ↗

Continued from the preceding page. ➡

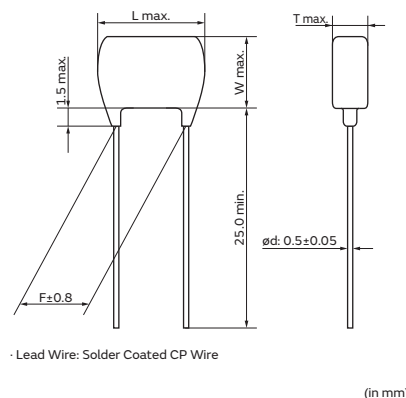
Dimensions code: 3  
Lead style code: K1



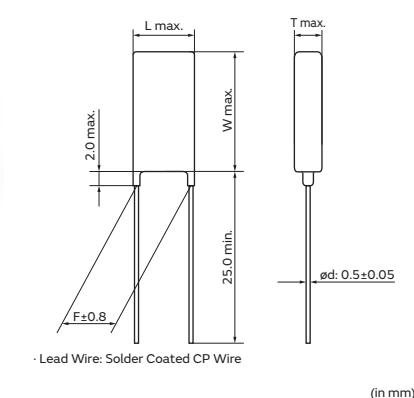
Dimensions code: 4  
Lead style code: K1



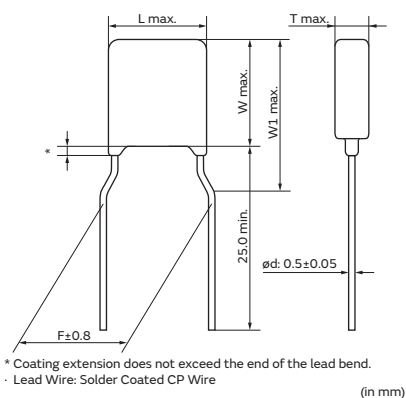
Dimensions code: 5  
Lead style code: B1



Dimensions code: U  
Lead style code: B1



Dimensions code: W  
Lead style code: K1



## Dimensions

| Dimensions and Lead Style Code | Dimensions (mm) |       |      |                                          |     |     |
|--------------------------------|-----------------|-------|------|------------------------------------------|-----|-----|
|                                | L               | W     | W1   | T                                        | F   | d   |
| 0A2/0DB                        | 3.6             | 3.5   | -    | See the individual product specification | 2.5 | 0.5 |
| 0K1/0M1                        | 3.6             | 3.5   | 6.0  |                                          | 5.0 | 0.5 |
| 1A2/1DB                        | 4.0             | 3.5   | -    |                                          | 2.5 | 0.5 |
| 1K1/1M1                        | 4.0             | 3.5   | 5.0  |                                          | 5.0 | 0.5 |
| 2A2/2DB                        | 5.5             | 4.0   | -    |                                          | 2.5 | 0.5 |
| 2K1/2M1                        | 5.5             | 4.0   | 6.0  |                                          | 5.0 | 0.5 |
| 3A2/3DB                        | 5.5             | 5.0   | -    |                                          | 2.5 | 0.5 |
| 3K1/3M1                        | 5.5             | 5.0   | 7.5  |                                          | 5.0 | 0.5 |
| 4K1/4M1                        | 7.5             | 5.5   | 8.0  |                                          | 5.0 | 0.5 |
| 5B1/5E1                        | 7.5             | 7.5*  | -    |                                          | 5.0 | 0.5 |
| UB1/UE1                        | 7.7             | 12.5* | -    |                                          | 5.0 | 0.5 |
| WK1/WM1                        | 5.5             | 7.5   | 10.0 |                                          | 5.0 | 0.5 |

\*DC630V, DC1kV: W+0.5mm

## Marking

1

| Dimensions<br>Code            | Rated<br>Voltage | DC25V                                                                                                                                        | DC50V       |             |             |             | DC100V      |             |                      | DC250V               | DC630V               | DC1kV |
|-------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------|----------------------|----------------------|-------|
|                               | Temp.<br>Char.   | X7R                                                                                                                                          | C0G         | X7S         | X7R         | C0G         | X7S         | X7R         | X7R, U2J, C0G        |                      |                      |       |
| 0                             |                  |                                                                                                                                              |             | -           |             |             | -           |             | -                    | -                    | -                    |       |
| 1                             |                  | 224K                                                                                                                                         | A<br>102J   | 105K        | 224K        | A<br>102J   | -           | 224K        | U<br>102J<br>(U2J)   | -                    | -                    |       |
|                               |                  |                                                                                                                                              |             |             |             |             |             |             | 102K<br>(X7R)        |                      |                      |       |
| 2                             |                  | M475<br>K2C                                                                                                                                  | M563<br>J5A | M475<br>K5C | M105<br>K5C | M103<br>J1A | -           | M105<br>K1C | M103<br>J4U<br>(U2J) | M472<br>J7U<br>(U2J) | M102<br>JAU<br>(U2J) |       |
|                               |                  |                                                                                                                                              |             |             |             |             |             |             | M473<br>K4C<br>(X7R) | M153<br>K7C<br>(X7R) | M102<br>KAC<br>(X7R) |       |
|                               |                  |                                                                                                                                              |             |             |             |             |             |             | M153<br>J4A<br>(C0G) | M332<br>J7A<br>(C0G) | M102<br>JAA<br>(C0G) |       |
| 3, 4, W                       |                  | M226<br>K2C                                                                                                                                  | -           | M106<br>K5C | M335<br>K5C | -           | M225<br>K1C | -           | M473<br>J4U<br>(U2J) | M103<br>J7U<br>(U2J) | M472<br>JAU<br>(U2J) |       |
|                               |                  |                                                                                                                                              |             |             |             |             |             |             | M224<br>K4C<br>(X7R) | M104<br>K7C<br>(X7R) | M333<br>KAC<br>(X7R) |       |
| 5, U                          |                  | -                                                                                                                                            | -           | -           | -           | -           | -           | -           | -                    | M333<br>J7U<br>(U2J) | M103<br>JAU<br>(U2J) |       |
|                               |                  |                                                                                                                                              |             |             |             |             |             |             | M474<br>K4C<br>(X7R) | M474<br>M7C<br>(X7R) | M104<br>KAC<br>(X7R) |       |
| Temperature Characteristics   |                  | Marked with code (C0G char.: A, X7S/X7R char.: C, U2J char.: U)<br>A part is omitted (Please refer to the marking example.)                  |             |             |             |             |             |             |                      |                      |                      |       |
| Nominal Capacitance           |                  | Under 100pF: Actual value 100pF and over: Marked with 3 figures                                                                              |             |             |             |             |             |             |                      |                      |                      |       |
| Capacitance Tolerance         |                  | Marked with code<br>A part is omitted (Please refer to the marking example.)                                                                 |             |             |             |             |             |             |                      |                      |                      |       |
| Rated Voltage                 |                  | Marked with code (DC25V: 2, DC50V: 5, DC100V: 1, DC250V: 4, DC630V: 7, DC1kV: A)<br>A part is omitted (Please refer to the marking example.) |             |             |             |             |             |             |                      |                      |                      |       |
| Manufacturer's Identification |                  | Marked with M<br>A part is omitted (Please refer to the marking example.)                                                                    |             |             |             |             |             |             |                      |                      |                      |       |

## Temperature Compensating Type, C0G/U2J Characteristics

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance  | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|--------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RCE5C1H1R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 1.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H1R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 1.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H2R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 2.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H2R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 2.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H3R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 3.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H3R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 3.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H4R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 4.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H4R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 4.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H5R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 5.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H5R0C0□□H03□ | C0G (EIA)      | 50Vdc            | 5.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |

Continued on the following page. ↗

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RCE5C1H6R0D0□□H03□ | COG (EIA)      | 50Vdc            | 6.0pF±0.5pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H6R0D0□□H03□ | COG (EIA)      | 50Vdc            | 6.0pF±0.5pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H7R0D0□□H03□ | COG (EIA)      | 50Vdc            | 7.0pF±0.5pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H7R0D0□□H03□ | COG (EIA)      | 50Vdc            | 7.0pF±0.5pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H8R0D0□□H03□ | COG (EIA)      | 50Vdc            | 8.0pF±0.5pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H8R0D0□□H03□ | COG (EIA)      | 50Vdc            | 8.0pF±0.5pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H9R0D0□□H03□ | COG (EIA)      | 50Vdc            | 9.0pF±0.5pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H9R0D0□□H03□ | COG (EIA)      | 50Vdc            | 9.0pF±0.5pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H100J0□□H03□ | COG (EIA)      | 50Vdc            | 10pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H100J0□□H03□ | COG (EIA)      | 50Vdc            | 10pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H120J0□□H03□ | COG (EIA)      | 50Vdc            | 12pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H120J0□□H03□ | COG (EIA)      | 50Vdc            | 12pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H150J0□□H03□ | COG (EIA)      | 50Vdc            | 15pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H150J0□□H03□ | COG (EIA)      | 50Vdc            | 15pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H180J0□□H03□ | COG (EIA)      | 50Vdc            | 18pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H180J0□□H03□ | COG (EIA)      | 50Vdc            | 18pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H220J0□□H03□ | COG (EIA)      | 50Vdc            | 22pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H220J0□□H03□ | COG (EIA)      | 50Vdc            | 22pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H270J0□□H03□ | COG (EIA)      | 50Vdc            | 27pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H270J0□□H03□ | COG (EIA)      | 50Vdc            | 27pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H330J0□□H03□ | COG (EIA)      | 50Vdc            | 33pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H330J0□□H03□ | COG (EIA)      | 50Vdc            | 33pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H390J0□□H03□ | COG (EIA)      | 50Vdc            | 39pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H390J0□□H03□ | COG (EIA)      | 50Vdc            | 39pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H470J0□□H03□ | COG (EIA)      | 50Vdc            | 47pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H470J0□□H03□ | COG (EIA)      | 50Vdc            | 47pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H560J0□□H03□ | COG (EIA)      | 50Vdc            | 56pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H560J0□□H03□ | COG (EIA)      | 50Vdc            | 56pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H680J0□□H03□ | COG (EIA)      | 50Vdc            | 68pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H680J0□□H03□ | COG (EIA)      | 50Vdc            | 68pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H820J0□□H03□ | COG (EIA)      | 50Vdc            | 82pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H820J0□□H03□ | COG (EIA)      | 50Vdc            | 82pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H101J0□□H03□ | COG (EIA)      | 50Vdc            | 100pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H101J0□□H03□ | COG (EIA)      | 50Vdc            | 100pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H121J0□□H03□ | COG (EIA)      | 50Vdc            | 120pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H121J0□□H03□ | COG (EIA)      | 50Vdc            | 120pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H151J0□□H03□ | COG (EIA)      | 50Vdc            | 150pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H151J0□□H03□ | COG (EIA)      | 50Vdc            | 150pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H181J0□□H03□ | COG (EIA)      | 50Vdc            | 180pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H181J0□□H03□ | COG (EIA)      | 50Vdc            | 180pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H221J0□□H03□ | COG (EIA)      | 50Vdc            | 220pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H221J0□□H03□ | COG (EIA)      | 50Vdc            | 220pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H271J0□□H03□ | COG (EIA)      | 50Vdc            | 270pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H271J0□□H03□ | COG (EIA)      | 50Vdc            | 270pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H331J0□□H03□ | COG (EIA)      | 50Vdc            | 330pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H331J0□□H03□ | COG (EIA)      | 50Vdc            | 330pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H391J0□□H03□ | COG (EIA)      | 50Vdc            | 390pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H391J0□□H03□ | COG (EIA)      | 50Vdc            | 390pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H471J0□□H03□ | COG (EIA)      | 50Vdc            | 470pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H471J0□□H03□ | COG (EIA)      | 50Vdc            | 470pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H561J0□□H03□ | COG (EIA)      | 50Vdc            | 560pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H561J0□□H03□ | COG (EIA)      | 50Vdc            | 560pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H681J0□□H03□ | COG (EIA)      | 50Vdc            | 680pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H681J0□□H03□ | COG (EIA)      | 50Vdc            | 680pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H821J0□□H03□ | COG (EIA)      | 50Vdc            | 820pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H821J0□□H03□ | COG (EIA)      | 50Vdc            | 820pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H102J0□□H03□ | COG (EIA)      | 50Vdc            | 1000pF±5%   | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance  | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|--------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RCE5C1H102J0□□H03□ | COG (EIA)      | 50Vdc            | 1000pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H122J0□□H03□ | COG (EIA)      | 50Vdc            | 1200pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H122J0□□H03□ | COG (EIA)      | 50Vdc            | 1200pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H152J0□□H03□ | COG (EIA)      | 50Vdc            | 1500pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H152J0□□H03□ | COG (EIA)      | 50Vdc            | 1500pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H182J0□□H03□ | COG (EIA)      | 50Vdc            | 1800pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H182J0□□H03□ | COG (EIA)      | 50Vdc            | 1800pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H222J0□□H03□ | COG (EIA)      | 50Vdc            | 2200pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H222J0□□H03□ | COG (EIA)      | 50Vdc            | 2200pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H272J0□□H03□ | COG (EIA)      | 50Vdc            | 2700pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H272J0□□H03□ | COG (EIA)      | 50Vdc            | 2700pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H332J0□□H03□ | COG (EIA)      | 50Vdc            | 3300pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H332J0□□H03□ | COG (EIA)      | 50Vdc            | 3300pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H392J0□□H03□ | COG (EIA)      | 50Vdc            | 3900pF±5%    | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H392J0□□H03□ | COG (EIA)      | 50Vdc            | 3900pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H472J1□□H03□ | COG (EIA)      | 50Vdc            | 4700pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H472J1□□H03□ | COG (EIA)      | 50Vdc            | 4700pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H562J1□□H03□ | COG (EIA)      | 50Vdc            | 5600pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H562J1□□H03□ | COG (EIA)      | 50Vdc            | 5600pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H682J1□□H03□ | COG (EIA)      | 50Vdc            | 6800pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H682J1□□H03□ | COG (EIA)      | 50Vdc            | 6800pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H822J1□□H03□ | COG (EIA)      | 50Vdc            | 8200pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H822J1□□H03□ | COG (EIA)      | 50Vdc            | 8200pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H103J1□□H03□ | COG (EIA)      | 50Vdc            | 10000pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H103J1□□H03□ | COG (EIA)      | 50Vdc            | 10000pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H123J1□□H03□ | COG (EIA)      | 50Vdc            | 12000pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H123J1□□H03□ | COG (EIA)      | 50Vdc            | 12000pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H153J1□□H03□ | COG (EIA)      | 50Vdc            | 15000pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H153J1□□H03□ | COG (EIA)      | 50Vdc            | 15000pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H183J1□□H03□ | COG (EIA)      | 50Vdc            | 18000pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H183J1□□H03□ | COG (EIA)      | 50Vdc            | 18000pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H223J1□□H03□ | COG (EIA)      | 50Vdc            | 22000pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C1H223J1□□H03□ | COG (EIA)      | 50Vdc            | 22000pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C1H273J2□□H03□ | COG (EIA)      | 50Vdc            | 27000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C1H273J2□□H03□ | COG (EIA)      | 50Vdc            | 27000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C1H333J2□□H03□ | COG (EIA)      | 50Vdc            | 33000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C1H333J2□□H03□ | COG (EIA)      | 50Vdc            | 33000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C1H393J2□□H03□ | COG (EIA)      | 50Vdc            | 39000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C1H393J2□□H03□ | COG (EIA)      | 50Vdc            | 39000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C1H473J2□□H03□ | COG (EIA)      | 50Vdc            | 47000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C1H473J2□□H03□ | COG (EIA)      | 50Vdc            | 47000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C1H563J2□□H03□ | COG (EIA)      | 50Vdc            | 56000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C1H563J2□□H03□ | COG (EIA)      | 50Vdc            | 56000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C1H683J2□□H03□ | COG (EIA)      | 50Vdc            | 68000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C1H683J2□□H03□ | COG (EIA)      | 50Vdc            | 68000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C1H823J2□□H03□ | COG (EIA)      | 50Vdc            | 82000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C1H823J2□□H03□ | COG (EIA)      | 50Vdc            | 82000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C1H104J2□□H03□ | COG (EIA)      | 50Vdc            | 0.1μF±5%     | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C1H104J2□□H03□ | COG (EIA)      | 50Vdc            | 0.1μF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2A1R0C0□□H03□ | COG (EIA)      | 100Vdc           | 1.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A1R0C0□□H03□ | COG (EIA)      | 100Vdc           | 1.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A2R0C0□□H03□ | COG (EIA)      | 100Vdc           | 2.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A2R0C0□□H03□ | COG (EIA)      | 100Vdc           | 2.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A3R0C0□□H03□ | COG (EIA)      | 100Vdc           | 3.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A3R0C0□□H03□ | COG (EIA)      | 100Vdc           | 3.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A4R0C0□□H03□ | COG (EIA)      | 100Vdc           | 4.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A4R0C0□□H03□ | COG (EIA)      | 100Vdc           | 4.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance  | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|--------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RCE5C2A5R0C0□□H03□ | COG (EIA)      | 100Vdc           | 5.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A5R0C0□□H03□ | COG (EIA)      | 100Vdc           | 5.0pF±0.25pF | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A6R0D0□□H03□ | COG (EIA)      | 100Vdc           | 6.0pF±0.5pF  | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A6R0D0□□H03□ | COG (EIA)      | 100Vdc           | 6.0pF±0.5pF  | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A7R0D0□□H03□ | COG (EIA)      | 100Vdc           | 7.0pF±0.5pF  | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A7R0D0□□H03□ | COG (EIA)      | 100Vdc           | 7.0pF±0.5pF  | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A8R0D0□□H03□ | COG (EIA)      | 100Vdc           | 8.0pF±0.5pF  | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A8R0D0□□H03□ | COG (EIA)      | 100Vdc           | 8.0pF±0.5pF  | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A9R0D0□□H03□ | COG (EIA)      | 100Vdc           | 9.0pF±0.5pF  | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A9R0D0□□H03□ | COG (EIA)      | 100Vdc           | 9.0pF±0.5pF  | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A100J0□□H03□ | COG (EIA)      | 100Vdc           | 10pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A100J0□□H03□ | COG (EIA)      | 100Vdc           | 10pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A120J0□□H03□ | COG (EIA)      | 100Vdc           | 12pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A120J0□□H03□ | COG (EIA)      | 100Vdc           | 12pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A150J0□□H03□ | COG (EIA)      | 100Vdc           | 15pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A150J0□□H03□ | COG (EIA)      | 100Vdc           | 15pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A180J0□□H03□ | COG (EIA)      | 100Vdc           | 18pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A180J0□□H03□ | COG (EIA)      | 100Vdc           | 18pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A220J0□□H03□ | COG (EIA)      | 100Vdc           | 22pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A220J0□□H03□ | COG (EIA)      | 100Vdc           | 22pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A270J0□□H03□ | COG (EIA)      | 100Vdc           | 27pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A270J0□□H03□ | COG (EIA)      | 100Vdc           | 27pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A330J0□□H03□ | COG (EIA)      | 100Vdc           | 33pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A330J0□□H03□ | COG (EIA)      | 100Vdc           | 33pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A390J0□□H03□ | COG (EIA)      | 100Vdc           | 39pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A390J0□□H03□ | COG (EIA)      | 100Vdc           | 39pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A470J0□□H03□ | COG (EIA)      | 100Vdc           | 47pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A470J0□□H03□ | COG (EIA)      | 100Vdc           | 47pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A560J0□□H03□ | COG (EIA)      | 100Vdc           | 56pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A560J0□□H03□ | COG (EIA)      | 100Vdc           | 56pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A680J0□□H03□ | COG (EIA)      | 100Vdc           | 68pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A680J0□□H03□ | COG (EIA)      | 100Vdc           | 68pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A820J0□□H03□ | COG (EIA)      | 100Vdc           | 82pF±5%      | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A820J0□□H03□ | COG (EIA)      | 100Vdc           | 82pF±5%      | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A101J0□□H03□ | COG (EIA)      | 100Vdc           | 100pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A101J0□□H03□ | COG (EIA)      | 100Vdc           | 100pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A121J0□□H03□ | COG (EIA)      | 100Vdc           | 120pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A121J0□□H03□ | COG (EIA)      | 100Vdc           | 120pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A151J0□□H03□ | COG (EIA)      | 100Vdc           | 150pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A151J0□□H03□ | COG (EIA)      | 100Vdc           | 150pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A181J0□□H03□ | COG (EIA)      | 100Vdc           | 180pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A181J0□□H03□ | COG (EIA)      | 100Vdc           | 180pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A221J0□□H03□ | COG (EIA)      | 100Vdc           | 220pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A221J0□□H03□ | COG (EIA)      | 100Vdc           | 220pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A271J0□□H03□ | COG (EIA)      | 100Vdc           | 270pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A271J0□□H03□ | COG (EIA)      | 100Vdc           | 270pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A331J0□□H03□ | COG (EIA)      | 100Vdc           | 330pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A331J0□□H03□ | COG (EIA)      | 100Vdc           | 330pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A391J0□□H03□ | COG (EIA)      | 100Vdc           | 390pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A391J0□□H03□ | COG (EIA)      | 100Vdc           | 390pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A471J0□□H03□ | COG (EIA)      | 100Vdc           | 470pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A471J0□□H03□ | COG (EIA)      | 100Vdc           | 470pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A561J0□□H03□ | COG (EIA)      | 100Vdc           | 560pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A561J0□□H03□ | COG (EIA)      | 100Vdc           | 560pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A681J0□□H03□ | COG (EIA)      | 100Vdc           | 680pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A681J0□□H03□ | COG (EIA)      | 100Vdc           | 680pF±5%     | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A821J0□□H03□ | COG (EIA)      | 100Vdc           | 820pF±5%     | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RCE5C2A821J0□□H03□ | COG (EIA)      | 100Vdc           | 820pF±5%    | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A102J0□□H03□ | COG (EIA)      | 100Vdc           | 1000pF±5%   | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A102J0□□H03□ | COG (EIA)      | 100Vdc           | 1000pF±5%   | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A122J0□□H03□ | COG (EIA)      | 100Vdc           | 1200pF±5%   | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A122J0□□H03□ | COG (EIA)      | 100Vdc           | 1200pF±5%   | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A152J0□□H03□ | COG (EIA)      | 100Vdc           | 1500pF±5%   | 3.6×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A152J0□□H03□ | COG (EIA)      | 100Vdc           | 1500pF±5%   | 3.6×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A182J1□□H03□ | COG (EIA)      | 100Vdc           | 1800pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A182J1□□H03□ | COG (EIA)      | 100Vdc           | 1800pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A222J1□□H03□ | COG (EIA)      | 100Vdc           | 2200pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A222J1□□H03□ | COG (EIA)      | 100Vdc           | 2200pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A272J1□□H03□ | COG (EIA)      | 100Vdc           | 2700pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A272J1□□H03□ | COG (EIA)      | 100Vdc           | 2700pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A332J1□□H03□ | COG (EIA)      | 100Vdc           | 3300pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DB                           |
| RCE5C2A332J1□□H03□ | COG (EIA)      | 100Vdc           | 3300pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RCE5C2A392J2□□H03□ | COG (EIA)      | 100Vdc           | 3900pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C2A392J2□□H03□ | COG (EIA)      | 100Vdc           | 3900pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2A472J2□□H03□ | COG (EIA)      | 100Vdc           | 4700pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C2A472J2□□H03□ | COG (EIA)      | 100Vdc           | 4700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2A562J2□□H03□ | COG (EIA)      | 100Vdc           | 5600pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C2A562J2□□H03□ | COG (EIA)      | 100Vdc           | 5600pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2A682J2□□H03□ | COG (EIA)      | 100Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C2A682J2□□H03□ | COG (EIA)      | 100Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2A822J2□□H03□ | COG (EIA)      | 100Vdc           | 8200pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C2A822J2□□H03□ | COG (EIA)      | 100Vdc           | 8200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2A103J2□□H03□ | COG (EIA)      | 100Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DB                           |
| RCE5C2A103J2□□H03□ | COG (EIA)      | 100Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E100J2□□H03□ | COG (EIA)      | 250Vdc           | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E120J2□□H03□ | COG (EIA)      | 250Vdc           | 12pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E150J2□□H03□ | COG (EIA)      | 250Vdc           | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E180J2□□H03□ | COG (EIA)      | 250Vdc           | 18pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E220J2□□H03□ | COG (EIA)      | 250Vdc           | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E270J2□□H03□ | COG (EIA)      | 250Vdc           | 27pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E330J2□□H03□ | COG (EIA)      | 250Vdc           | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E390J2□□H03□ | COG (EIA)      | 250Vdc           | 39pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E470J2□□H03□ | COG (EIA)      | 250Vdc           | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E560J2□□H03□ | COG (EIA)      | 250Vdc           | 56pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E680J2□□H03□ | COG (EIA)      | 250Vdc           | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E820J2□□H03□ | COG (EIA)      | 250Vdc           | 82pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E101J2□□H03□ | COG (EIA)      | 250Vdc           | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E121J2□□H03□ | COG (EIA)      | 250Vdc           | 120pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E151J2□□H03□ | COG (EIA)      | 250Vdc           | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E181J2□□H03□ | COG (EIA)      | 250Vdc           | 180pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E221J2□□H03□ | COG (EIA)      | 250Vdc           | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E271J2□□H03□ | COG (EIA)      | 250Vdc           | 270pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E331J2□□H03□ | COG (EIA)      | 250Vdc           | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E391J2□□H03□ | COG (EIA)      | 250Vdc           | 390pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E471J2□□H03□ | COG (EIA)      | 250Vdc           | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E561J2□□H03□ | COG (EIA)      | 250Vdc           | 560pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E681J2□□H03□ | COG (EIA)      | 250Vdc           | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E821J2□□H03□ | COG (EIA)      | 250Vdc           | 820pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E102J2□□H03□ | COG (EIA)      | 250Vdc           | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E122J2□□H03□ | COG (EIA)      | 250Vdc           | 1200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E152J2□□H03□ | COG (EIA)      | 250Vdc           | 1500pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E182J2□□H03□ | COG (EIA)      | 250Vdc           | 1800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E222J2□□H03□ | COG (EIA)      | 250Vdc           | 2200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E272J2□□H03□ | COG (EIA)      | 250Vdc           | 2700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RCE5C2E332J2□□H03□ | COG (EIA)      | 250Vdc           | 3300pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E392J2□□H03□ | COG (EIA)      | 250Vdc           | 3900pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E472J2□□H03□ | COG (EIA)      | 250Vdc           | 4700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E562J2□□H03□ | COG (EIA)      | 250Vdc           | 5600pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E682J2□□H03□ | COG (EIA)      | 250Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E822J2□□H03□ | COG (EIA)      | 250Vdc           | 8200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E103J2□□H03□ | COG (EIA)      | 250Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E123J2□□H03□ | COG (EIA)      | 250Vdc           | 12000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2E153J2□□H03□ | COG (EIA)      | 250Vdc           | 15000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J100J2□□H03□ | COG (EIA)      | 630Vdc           | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J120J2□□H03□ | COG (EIA)      | 630Vdc           | 12pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J150J2□□H03□ | COG (EIA)      | 630Vdc           | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J180J2□□H03□ | COG (EIA)      | 630Vdc           | 18pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J220J2□□H03□ | COG (EIA)      | 630Vdc           | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J270J2□□H03□ | COG (EIA)      | 630Vdc           | 27pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J330J2□□H03□ | COG (EIA)      | 630Vdc           | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J390J2□□H03□ | COG (EIA)      | 630Vdc           | 39pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J470J2□□H03□ | COG (EIA)      | 630Vdc           | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J560J2□□H03□ | COG (EIA)      | 630Vdc           | 56pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J680J2□□H03□ | COG (EIA)      | 630Vdc           | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J820J2□□H03□ | COG (EIA)      | 630Vdc           | 82pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J101J2□□H03□ | COG (EIA)      | 630Vdc           | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J121J2□□H03□ | COG (EIA)      | 630Vdc           | 120pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J151J2□□H03□ | COG (EIA)      | 630Vdc           | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J181J2□□H03□ | COG (EIA)      | 630Vdc           | 180pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J221J2□□H03□ | COG (EIA)      | 630Vdc           | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J271J2□□H03□ | COG (EIA)      | 630Vdc           | 270pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J331J2□□H03□ | COG (EIA)      | 630Vdc           | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J391J2□□H03□ | COG (EIA)      | 630Vdc           | 390pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J471J2□□H03□ | COG (EIA)      | 630Vdc           | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J561J2□□H03□ | COG (EIA)      | 630Vdc           | 560pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J681J2□□H03□ | COG (EIA)      | 630Vdc           | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J821J2□□H03□ | COG (EIA)      | 630Vdc           | 820pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J102J2□□H03□ | COG (EIA)      | 630Vdc           | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J122J2□□H03□ | COG (EIA)      | 630Vdc           | 1200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J152J2□□H03□ | COG (EIA)      | 630Vdc           | 1500pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J182J2□□H03□ | COG (EIA)      | 630Vdc           | 1800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J222J2□□H03□ | COG (EIA)      | 630Vdc           | 2200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J272J2□□H03□ | COG (EIA)      | 630Vdc           | 2700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C2J332J2□□H03□ | COG (EIA)      | 630Vdc           | 3300pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A100J2□□H03□ | COG (EIA)      | 1000Vdc          | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A120J2□□H03□ | COG (EIA)      | 1000Vdc          | 12pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A150J2□□H03□ | COG (EIA)      | 1000Vdc          | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A180J2□□H03□ | COG (EIA)      | 1000Vdc          | 18pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A220J2□□H03□ | COG (EIA)      | 1000Vdc          | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A270J2□□H03□ | COG (EIA)      | 1000Vdc          | 27pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A330J2□□H03□ | COG (EIA)      | 1000Vdc          | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A390J2□□H03□ | COG (EIA)      | 1000Vdc          | 39pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A470J2□□H03□ | COG (EIA)      | 1000Vdc          | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A560J2□□H03□ | COG (EIA)      | 1000Vdc          | 56pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A680J2□□H03□ | COG (EIA)      | 1000Vdc          | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A820J2□□H03□ | COG (EIA)      | 1000Vdc          | 82pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A101J2□□H03□ | COG (EIA)      | 1000Vdc          | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A121J2□□H03□ | COG (EIA)      | 1000Vdc          | 120pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A151J2□□H03□ | COG (EIA)      | 1000Vdc          | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A181J2□□H03□ | COG (EIA)      | 1000Vdc          | 180pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A221J2□□H03□ | COG (EIA)      | 1000Vdc          | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RCE5C3A271J2□□H03□ | C0G (EIA)      | 1000Vdc          | 270pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A331J2□□H03□ | C0G (EIA)      | 1000Vdc          | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A391J2□□H03□ | C0G (EIA)      | 1000Vdc          | 390pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A471J2□□H03□ | C0G (EIA)      | 1000Vdc          | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A561J2□□H03□ | C0G (EIA)      | 1000Vdc          | 560pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A681J2□□H03□ | C0G (EIA)      | 1000Vdc          | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A821J2□□H03□ | C0G (EIA)      | 1000Vdc          | 820pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE5C3A102J2□□H03□ | C0G (EIA)      | 1000Vdc          | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E101J1□□H03□ | U2J (EIA)      | 250Vdc           | 100pF±5%    | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E151J1□□H03□ | U2J (EIA)      | 250Vdc           | 150pF±5%    | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E221J1□□H03□ | U2J (EIA)      | 250Vdc           | 220pF±5%    | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E331J1□□H03□ | U2J (EIA)      | 250Vdc           | 330pF±5%    | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E471J1□□H03□ | U2J (EIA)      | 250Vdc           | 470pF±5%    | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E681J1□□H03□ | U2J (EIA)      | 250Vdc           | 680pF±5%    | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E102J1□□H03□ | U2J (EIA)      | 250Vdc           | 1000pF±5%   | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E152J1□□H03□ | U2J (EIA)      | 250Vdc           | 1500pF±5%   | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E222J1□□H03□ | U2J (EIA)      | 250Vdc           | 2200pF±5%   | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E332J1□□H03□ | U2J (EIA)      | 250Vdc           | 3300pF±5%   | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E472J1□□H03□ | U2J (EIA)      | 250Vdc           | 4700pF±5%   | 4.0×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E682J2□□H03□ | U2J (EIA)      | 250Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2E103J2□□H03□ | U2J (EIA)      | 250Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J100J2□□H03□ | U2J (EIA)      | 630Vdc           | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J150J2□□H03□ | U2J (EIA)      | 630Vdc           | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J220J2□□H03□ | U2J (EIA)      | 630Vdc           | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J330J2□□H03□ | U2J (EIA)      | 630Vdc           | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J470J2□□H03□ | U2J (EIA)      | 630Vdc           | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J680J2□□H03□ | U2J (EIA)      | 630Vdc           | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J101J2□□H03□ | U2J (EIA)      | 630Vdc           | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J151J2□□H03□ | U2J (EIA)      | 630Vdc           | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J221J2□□H03□ | U2J (EIA)      | 630Vdc           | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J331J2□□H03□ | U2J (EIA)      | 630Vdc           | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J471J2□□H03□ | U2J (EIA)      | 630Vdc           | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J681J2□□H03□ | U2J (EIA)      | 630Vdc           | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J102J2□□H03□ | U2J (EIA)      | 630Vdc           | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J152J2□□H03□ | U2J (EIA)      | 630Vdc           | 1500pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J222J2□□H03□ | U2J (EIA)      | 630Vdc           | 2200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J332J2□□H03□ | U2J (EIA)      | 630Vdc           | 3300pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J472J2□□H03□ | U2J (EIA)      | 630Vdc           | 4700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U2J682J3□□H03□ | U2J (EIA)      | 630Vdc           | 6800pF±5%   | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCE7U2J103J3□□H03□ | U2J (EIA)      | 630Vdc           | 10000pF±5%  | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCE7U2J153J4□□H03□ | U2J (EIA)      | 630Vdc           | 15000pF±5%  | 7.5×5.5                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCE7U2J223J4□□H03□ | U2J (EIA)      | 630Vdc           | 22000pF±5%  | 7.5×5.5                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCE7U2J333J5□□H03□ | U2J (EIA)      | 630Vdc           | 33000pF±5%  | 7.5×8.0                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RCE7U2J473J5□□H03□ | U2J (EIA)      | 630Vdc           | 47000pF±5%  | 7.5×8.0                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RCE7U2J943JU□□H03□ | U2J (EIA)      | 630Vdc           | 94000pF±5%  | 7.7×13.0                  | 4.0                    | 5.0                     | B1                         | E1                           |
| RCE7U3A100J2□□H03□ | U2J (EIA)      | 1000Vdc          | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A150J2□□H03□ | U2J (EIA)      | 1000Vdc          | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A220J2□□H03□ | U2J (EIA)      | 1000Vdc          | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A330J2□□H03□ | U2J (EIA)      | 1000Vdc          | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A470J2□□H03□ | U2J (EIA)      | 1000Vdc          | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A680J2□□H03□ | U2J (EIA)      | 1000Vdc          | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A101J2□□H03□ | U2J (EIA)      | 1000Vdc          | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A151J2□□H03□ | U2J (EIA)      | 1000Vdc          | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A221J2□□H03□ | U2J (EIA)      | 1000Vdc          | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A331J2□□H03□ | U2J (EIA)      | 1000Vdc          | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A471J2□□H03□ | U2J (EIA)      | 1000Vdc          | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCE7U3A681J2□□H03□ | U2J (EIA)      | 1000Vdc          | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |

Continued on the following page. ➡

Continued from the preceding page. ↩

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RCE7U3A102J2□□H03□ | U2J (EIA)   | 1000Vdc       | 1000pF±5%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCE7U3A152J3□□H03□ | U2J (EIA)   | 1000Vdc       | 1500pF±5%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCE7U3A222J3□□H03□ | U2J (EIA)   | 1000Vdc       | 2200pF±5%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCE7U3A332J4□□H03□ | U2J (EIA)   | 1000Vdc       | 3300pF±5%   | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RCE7U3A472J4□□H03□ | U2J (EIA)   | 1000Vdc       | 4700pF±5%   | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RCE7U3A682J5□□H03□ | U2J (EIA)   | 1000Vdc       | 6800pF±5%   | 7.5×8.0             | 4.0              | 5.0               | B1                   | E1                     |
| RCE7U3A103J5□□H03□ | U2J (EIA)   | 1000Vdc       | 10000pF±5%  | 7.5×8.0             | 4.0              | 5.0               | B1                   | E1                     |
| RCE7U3A203JU□□H03□ | U2J (EIA)   | 1000Vdc       | 20000pF±5%  | 7.7×13.0            | 4.0              | 5.0               | B1                   | E1                     |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## High Dielectric Constant Type, X7R/X7S Characteristics

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RCER71E104K0□□H03□ | X7R (EIA)   | 25Vdc         | 0.1μF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71E104K0□□H03□ | X7R (EIA)   | 25Vdc         | 0.1μF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71E154K0□□H03□ | X7R (EIA)   | 25Vdc         | 0.15μF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71E154K0□□H03□ | X7R (EIA)   | 25Vdc         | 0.15μF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71E224K0□□H03□ | X7R (EIA)   | 25Vdc         | 0.22μF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71E224K0□□H03□ | X7R (EIA)   | 25Vdc         | 0.22μF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71E334K1□□H03□ | X7R (EIA)   | 25Vdc         | 0.33μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71E334K1□□H03□ | X7R (EIA)   | 25Vdc         | 0.33μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71E474K1□□H03□ | X7R (EIA)   | 25Vdc         | 0.47μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71E474K1□□H03□ | X7R (EIA)   | 25Vdc         | 0.47μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71E684K1□□H03□ | X7R (EIA)   | 25Vdc         | 0.68μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71E684K1□□H03□ | X7R (EIA)   | 25Vdc         | 0.68μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71E105K1□□H03□ | X7R (EIA)   | 25Vdc         | 1.0μF±10%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71E105K1□□H03□ | X7R (EIA)   | 25Vdc         | 1.0μF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71E155K2□□H03□ | X7R (EIA)   | 25Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER71E155K2□□H03□ | X7R (EIA)   | 25Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER71E225K2□□H03□ | X7R (EIA)   | 25Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER71E225K2□□H03□ | X7R (EIA)   | 25Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER71E335K2□□H03□ | X7R (EIA)   | 25Vdc         | 3.3μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER71E335K2□□H03□ | X7R (EIA)   | 25Vdc         | 3.3μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER71E475K2□□H03□ | X7R (EIA)   | 25Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER71E475K2□□H03□ | X7R (EIA)   | 25Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER71E106K3□□H03□ | X7R (EIA)   | 25Vdc         | 10μF±10%    | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RCER71E106K3□□H03□ | X7R (EIA)   | 25Vdc         | 10μF±10%    | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCER71E226MW□□H03□ | X7R (EIA)   | 25Vdc         | 22μF±20%    | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RCER71H221K0□□H03□ | X7R (EIA)   | 50Vdc         | 220pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H221K0□□H03□ | X7R (EIA)   | 50Vdc         | 220pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H331K0□□H03□ | X7R (EIA)   | 50Vdc         | 330pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H331K0□□H03□ | X7R (EIA)   | 50Vdc         | 330pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H471K0□□H03□ | X7R (EIA)   | 50Vdc         | 470pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H471K0□□H03□ | X7R (EIA)   | 50Vdc         | 470pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H681K0□□H03□ | X7R (EIA)   | 50Vdc         | 680pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H681K0□□H03□ | X7R (EIA)   | 50Vdc         | 680pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H102K0□□H03□ | X7R (EIA)   | 50Vdc         | 1000pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H102K0□□H03□ | X7R (EIA)   | 50Vdc         | 1000pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H152K0□□H03□ | X7R (EIA)   | 50Vdc         | 1500pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H152K0□□H03□ | X7R (EIA)   | 50Vdc         | 1500pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H222K0□□H03□ | X7R (EIA)   | 50Vdc         | 2200pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H222K0□□H03□ | X7R (EIA)   | 50Vdc         | 2200pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H332K0□□H03□ | X7R (EIA)   | 50Vdc         | 3300pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H332K0□□H03□ | X7R (EIA)   | 50Vdc         | 3300pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H472K0□□H03□ | X7R (EIA)   | 50Vdc         | 4700pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RCER71H472K0□□H03□ | X7R (EIA)   | 50Vdc         | 4700pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H682K0□□H03□ | X7R (EIA)   | 50Vdc         | 6800pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H682K0□□H03□ | X7R (EIA)   | 50Vdc         | 6800pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H103K0□□H03□ | X7R (EIA)   | 50Vdc         | 10000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H103K0□□H03□ | X7R (EIA)   | 50Vdc         | 10000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H153K0□□H03□ | X7R (EIA)   | 50Vdc         | 15000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H153K0□□H03□ | X7R (EIA)   | 50Vdc         | 15000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H223K0□□H03□ | X7R (EIA)   | 50Vdc         | 22000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H223K0□□H03□ | X7R (EIA)   | 50Vdc         | 22000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H333K0□□H03□ | X7R (EIA)   | 50Vdc         | 33000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H333K0□□H03□ | X7R (EIA)   | 50Vdc         | 33000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H473K0□□H03□ | X7R (EIA)   | 50Vdc         | 47000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H473K0□□H03□ | X7R (EIA)   | 50Vdc         | 47000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H683K0□□H03□ | X7R (EIA)   | 50Vdc         | 68000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H683K0□□H03□ | X7R (EIA)   | 50Vdc         | 68000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H104K0□□H03□ | X7R (EIA)   | 50Vdc         | 0.10μF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H104K0□□H03□ | X7R (EIA)   | 50Vdc         | 0.10μF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H154K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.15μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H154K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.15μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H224K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.22μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H224K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.22μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H334K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.33μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H334K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.33μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H474K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.47μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER71H474K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.47μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H684K2□□H03□ | X7R (EIA)   | 50Vdc         | 0.68μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER71H684K2□□H03□ | X7R (EIA)   | 50Vdc         | 0.68μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCEC71H105K1□□H03□ | X7S (EIA)   | 50Vdc         | 1.0μF±10%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCEC71H105K1□□H03□ | X7S (EIA)   | 50Vdc         | 1.0μF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER71H105K2□□H03□ | X7R (EIA)   | 50Vdc         | 1.0μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER71H105K2□□H03□ | X7R (EIA)   | 50Vdc         | 1.0μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER71H155K2□□H03□ | X7R (EIA)   | 50Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER71H155K2□□H03□ | X7R (EIA)   | 50Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER71H225K2□□H03□ | X7R (EIA)   | 50Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER71H225K2□□H03□ | X7R (EIA)   | 50Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER71H335K3□□H03□ | X7R (EIA)   | 50Vdc         | 3.3μF±10%   | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RCER71H335K3□□H03□ | X7R (EIA)   | 50Vdc         | 3.3μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCEC71H475K2□□H03□ | X7S (EIA)   | 50Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCEC71H475K2□□H03□ | X7S (EIA)   | 50Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER71H475K3□□H03□ | X7R (EIA)   | 50Vdc         | 4.7μF±10%   | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RCER71H475K3□□H03□ | X7R (EIA)   | 50Vdc         | 4.7μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCEC71H106K3□□H03□ | X7S (EIA)   | 50Vdc         | 10μF±10%    | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RCEC71H106K3□□H03□ | X7S (EIA)   | 50Vdc         | 10μF±10%    | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCER71H106MW□□H03□ | X7R (EIA)   | 50Vdc         | 10μF±20%    | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RCEC71H226MW□□H03□ | X7S (EIA)   | 50Vdc         | 22μF±20%    | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RCER72A221K0□□H03□ | X7R (EIA)   | 100Vdc        | 220pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A221K0□□H03□ | X7R (EIA)   | 100Vdc        | 220pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A331K0□□H03□ | X7R (EIA)   | 100Vdc        | 330pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A331K0□□H03□ | X7R (EIA)   | 100Vdc        | 330pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A471K0□□H03□ | X7R (EIA)   | 100Vdc        | 470pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A471K0□□H03□ | X7R (EIA)   | 100Vdc        | 470pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A681K0□□H03□ | X7R (EIA)   | 100Vdc        | 680pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A681K0□□H03□ | X7R (EIA)   | 100Vdc        | 680pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A102K0□□H03□ | X7R (EIA)   | 100Vdc        | 1000pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A102K0□□H03□ | X7R (EIA)   | 100Vdc        | 1000pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A152K0□□H03□ | X7R (EIA)   | 100Vdc        | 1500pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A152K0□□H03□ | X7R (EIA)   | 100Vdc        | 1500pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RCER72A222K0□□H03□ | X7R (EIA)   | 100Vdc        | 2200pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A222K0□□H03□ | X7R (EIA)   | 100Vdc        | 2200pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A332K0□□H03□ | X7R (EIA)   | 100Vdc        | 3300pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A332K0□□H03□ | X7R (EIA)   | 100Vdc        | 3300pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A472K0□□H03□ | X7R (EIA)   | 100Vdc        | 4700pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A472K0□□H03□ | X7R (EIA)   | 100Vdc        | 4700pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A682K0□□H03□ | X7R (EIA)   | 100Vdc        | 6800pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A682K0□□H03□ | X7R (EIA)   | 100Vdc        | 6800pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A103K0□□H03□ | X7R (EIA)   | 100Vdc        | 10000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A103K0□□H03□ | X7R (EIA)   | 100Vdc        | 10000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A153K0□□H03□ | X7R (EIA)   | 100Vdc        | 15000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A153K0□□H03□ | X7R (EIA)   | 100Vdc        | 15000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A223K0□□H03□ | X7R (EIA)   | 100Vdc        | 22000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A223K0□□H03□ | X7R (EIA)   | 100Vdc        | 22000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A333K1□□H03□ | X7R (EIA)   | 100Vdc        | 33000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A333K1□□H03□ | X7R (EIA)   | 100Vdc        | 33000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A473K1□□H03□ | X7R (EIA)   | 100Vdc        | 47000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A473K1□□H03□ | X7R (EIA)   | 100Vdc        | 47000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A683K1□□H03□ | X7R (EIA)   | 100Vdc        | 68000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A683K1□□H03□ | X7R (EIA)   | 100Vdc        | 68000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A104K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.10μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A104K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.10μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A154K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.15μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER72A154K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.15μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72A224K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.22μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER72A224K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.22μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72A334K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.33μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RCER72A334K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.33μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RCER72A474K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.47μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER72A474K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.47μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72A684K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.68μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER72A684K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.68μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72A105K2□□H03□ | X7R (EIA)   | 100Vdc        | 1.0μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RCER72A105K2□□H03□ | X7R (EIA)   | 100Vdc        | 1.0μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCEC72A155K3□□H03□ | X7S (EIA)   | 100Vdc        | 1.5μF±10%   | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RCEC72A155K3□□H03□ | X7S (EIA)   | 100Vdc        | 1.5μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCEC72A225K3□□H03□ | X7S (EIA)   | 100Vdc        | 2.2μF±10%   | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RCEC72A225K3□□H03□ | X7S (EIA)   | 100Vdc        | 2.2μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCEC72A475MW□□H03□ | X7S (EIA)   | 100Vdc        | 4.7μF±20%   | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RCER72E102K1□□H03□ | X7R (EIA)   | 250Vdc        | 1000pF±10%  | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E152K1□□H03□ | X7R (EIA)   | 250Vdc        | 1500pF±10%  | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E222K1□□H03□ | X7R (EIA)   | 250Vdc        | 2200pF±10%  | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E332K1□□H03□ | X7R (EIA)   | 250Vdc        | 3300pF±10%  | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E472K1□□H03□ | X7R (EIA)   | 250Vdc        | 4700pF±10%  | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E682K1□□H03□ | X7R (EIA)   | 250Vdc        | 6800pF±10%  | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E103K1□□H03□ | X7R (EIA)   | 250Vdc        | 10000pF±10% | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E153K1□□H03□ | X7R (EIA)   | 250Vdc        | 15000pF±10% | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E223K1□□H03□ | X7R (EIA)   | 250Vdc        | 22000pF±10% | 4.0×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E333K2□□H03□ | X7R (EIA)   | 250Vdc        | 33000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E473K2□□H03□ | X7R (EIA)   | 250Vdc        | 47000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E683K2□□H03□ | X7R (EIA)   | 250Vdc        | 68000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E104K2□□H03□ | X7R (EIA)   | 250Vdc        | 0.10μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RCER72E154K3□□H03□ | X7R (EIA)   | 250Vdc        | 0.15μF±10%  | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCER72E224K3□□H03□ | X7R (EIA)   | 250Vdc        | 0.22μF±10%  | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RCER72E334K4□□H03□ | X7R (EIA)   | 250Vdc        | 0.33μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RCER72E474K4□□H03□ | X7R (EIA)   | 250Vdc        | 0.47μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RCER72E684K5□□H03□ | X7R (EIA)   | 250Vdc        | 0.68μF±10%  | 7.5×7.5             | 4.0              | 5.0               | B1                   | E1                     |

Continued on the following page. ➡

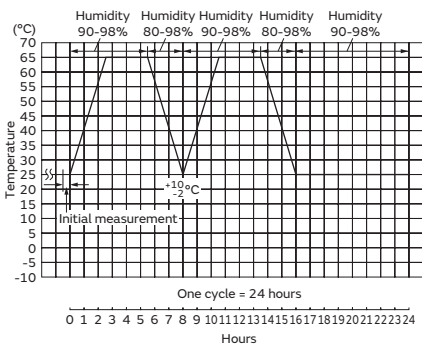
Continued from the preceding page. ↘

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RCER72E105K5□□H03□ | X7R (EIA)      | 250Vdc           | 1.0μF±10%   | 7.5×7.5                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RCER72E225MU□□H03□ | X7R (EIA)      | 250Vdc           | 2.2μF±20%   | 7.5×12.5                  | 4.0                    | 5.0                     | B1                         | E1                           |
| RCER72J102K2□□H03□ | X7R (EIA)      | 630Vdc           | 1000pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J152K2□□H03□ | X7R (EIA)      | 630Vdc           | 1500pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J222K2□□H03□ | X7R (EIA)      | 630Vdc           | 2200pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J332K2□□H03□ | X7R (EIA)      | 630Vdc           | 3300pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J472K2□□H03□ | X7R (EIA)      | 630Vdc           | 4700pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J682K2□□H03□ | X7R (EIA)      | 630Vdc           | 6800pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J103K2□□H03□ | X7R (EIA)      | 630Vdc           | 10000pF±10% | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J153K2□□H03□ | X7R (EIA)      | 630Vdc           | 15000pF±10% | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J223K2□□H03□ | X7R (EIA)      | 630Vdc           | 22000pF±10% | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER72J333K3□□H03□ | X7R (EIA)      | 630Vdc           | 33000pF±10% | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCER72J473K3□□H03□ | X7R (EIA)      | 630Vdc           | 47000pF±10% | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCER72J683K4□□H03□ | X7R (EIA)      | 630Vdc           | 68000pF±10% | 7.5×5.5                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCER72J104K4□□H03□ | X7R (EIA)      | 630Vdc           | 0.10μF±10%  | 7.5×5.5                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCER72J154K5□□H03□ | X7R (EIA)      | 630Vdc           | 0.15μF±10%  | 7.5×8.0                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RCER72J224K5□□H03□ | X7R (EIA)      | 630Vdc           | 0.22μF±10%  | 7.5×8.0                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RCER72J474MU□□H03□ | X7R (EIA)      | 630Vdc           | 0.47μF±20%  | 7.7×13.0                  | 4.0                    | 5.0                     | B1                         | E1                           |
| RCER73A102K2□□H03□ | X7R (EIA)      | 1000Vdc          | 1000pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER73A152K2□□H03□ | X7R (EIA)      | 1000Vdc          | 1500pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER73A222K2□□H03□ | X7R (EIA)      | 1000Vdc          | 2200pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER73A332K2□□H03□ | X7R (EIA)      | 1000Vdc          | 3300pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER73A472K2□□H03□ | X7R (EIA)      | 1000Vdc          | 4700pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER73A682K2□□H03□ | X7R (EIA)      | 1000Vdc          | 6800pF±10%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER73A103K2□□H03□ | X7R (EIA)      | 1000Vdc          | 10000pF±10% | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RCER73A153K3□□H03□ | X7R (EIA)      | 1000Vdc          | 15000pF±10% | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCER73A223K3□□H03□ | X7R (EIA)      | 1000Vdc          | 22000pF±10% | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCER73A333K4□□H03□ | X7R (EIA)      | 1000Vdc          | 33000pF±10% | 7.5×5.5                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCER73A473K4□□H03□ | X7R (EIA)      | 1000Vdc          | 47000pF±10% | 7.5×5.5                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RCER73A683K5□□H03□ | X7R (EIA)      | 1000Vdc          | 68000pF±10% | 7.5×8.0                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RCER73A104K5□□H03□ | X7R (EIA)      | 1000Vdc          | 0.10μF±10%  | 7.5×8.0                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RCER73A224MU□□H03□ | X7R (EIA)      | 1000Vdc          | 0.22μF±20%  | 7.7×13.0                  | 4.0                    | 5.0                     | B1                         | E1                           |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## Temperature Compensating Type Specifications and Test Methods

1

| No.                | AEC-Q200 Test Item                                                                                             | Specifications                                                                                                 | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                       |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|--------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------|---------------|---------------------------|--------|---------------------------|---------------|---------------------------|----------|------------|------------|------|---|------|---|
| 1                  | Pre-and Post-Stress Electrical Test                                                                            | -                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| 2                  | High Temperature Exposure (Storage)                                                                            | The measured and observed characteristics should satisfy the specifications in the following table.            | Sit the capacitor for 1000±12h at 150±3°C. Let sit for 24±2h at room condition*, then measure.                                                                                                                                                                                                                                                                                                                                             |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Appearance                                                                                                     | No defects or abnormalities                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Capacitance Change                                                                                             | Within ±3% or ±0.3pF (Whichever is larger)                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Q                                                                                                              | 30pF ≤ C: Q ≥ 350<br>10pF ≤ C < 30pF: Q ≥ 275+5C/2<br>10pF > C: Q ≥ 200+10C<br><br>C: Nominal Capacitance (pF) |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | I.R.                                                                                                           | More than 1000MΩ or 50MΩ • μF (Whichever is smaller)                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| 3                  | Temperature Cycling                                                                                            | The measured and observed characteristics should satisfy the specifications in the following table.            | Perform the 1000 cycles according to the four heat treatments listed in the following table. Let sit for 24±2h at room condition*, then measure.<br><table><tr><th>Step</th><th>1</th><th>2</th><th>3</th><th>4</th></tr><tr><td>Temp. (°C)</td><td>-55+0/-3</td><td>Room Temp.</td><td>125+3/-0</td><td>Room Temp.</td></tr><tr><td>Time (min)</td><td>15±3</td><td>1</td><td>15±3</td><td>1</td></tr></table>                            | Step          | 1            | 2             | 3                         | 4      | Temp. (°C)                | -55+0/-3      | Room Temp.                | 125+3/-0 | Room Temp. | Time (min) | 15±3 | 1 | 15±3 | 1 |
|                    | Step                                                                                                           | 1                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2             | 3            | 4             |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Temp. (°C)                                                                                                     | -55+0/-3                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                            | Room Temp.    | 125+3/-0     | Room Temp.    |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Time (min)                                                                                                     | 15±3                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1             | 15±3         | 1             |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Appearance                                                                                                     | No defects or abnormalities                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| Capacitance Change | Within ±5% or ±0.5pF (Whichever is larger)                                                                     |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| Q                  | 30pF ≤ C: Q ≥ 350<br>10pF ≤ C < 30pF: Q ≥ 275+5C/2<br>10pF > C: Q ≥ 200+10C<br><br>C: Nominal Capacitance (pF) |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| I.R.               | 1000MΩ or 50MΩ • μF min. (Whichever is smaller)                                                                |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| 4                  | Moisture Resistance                                                                                            | The measured and observed characteristics should satisfy the specifications in the following table.            | Apply the 24h heat (25 to 65°C) and humidity (80 to 98%) treatment shown below, 10 consecutive times.<br>Let sit for 24±2h at room condition*, then measure.<br>                                                                                                                                                                                       |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Appearance                                                                                                     | No defects or abnormalities                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Capacitance Change                                                                                             | Within ±5% or ±0.5pF (Whichever is larger)                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Q                                                                                                              | 30pF ≤ C: Q ≥ 200<br>30pF > C: Q ≥ 100+10C/3<br><br>C: Nominal Capacitance (pF)                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | I.R.                                                                                                           | 500MΩ or 25MΩ • μF min. (Whichever is smaller)                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| 5                  | Biased Humidity                                                                                                | The measured and observed characteristics should satisfy the specifications in the following table.            | Apply the rated voltage and DC1.3+0.2/-0V (add 100kΩ resistor) at 85±3°C and 80 to 85% humidity for 1000±12h.<br>Remove and let sit for 24±2h at room condition*, then measure.<br>The charge/discharge current is less than 50mA.                                                                                                                                                                                                         |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Appearance                                                                                                     | No defects or abnormalities                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Capacitance Change                                                                                             | Within ±5% or ±0.5pF (Whichever is larger)                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | Q                                                                                                              | 30pF ≤ C: Q ≥ 200<br>30pF > C: Q ≥ 100+10C/3<br><br>C: Nominal Capacitance (pF)                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | I.R.                                                                                                           | 500MΩ or 25MΩ • μF min. (Whichever is smaller)                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| 6                  | Operational Life                                                                                               | The measured and observed characteristics should satisfy the specifications in the following table.            | Apply the voltage shown in the table for 1000±12h at 125±3°C.<br>Let sit for 24±2h at room condition*, then measure.<br>The charge/discharge current is less than 50mA.<br><table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC50V, DC100V</td><td>200% of the rated voltage</td></tr><tr><td>DC250V</td><td>150% of the rated voltage</td></tr><tr><td>DC630V, DC1kV</td><td>120% of the rated voltage</td></tr></table> | Rated Voltage | Test Voltage | DC50V, DC100V | 200% of the rated voltage | DC250V | 150% of the rated voltage | DC630V, DC1kV | 120% of the rated voltage |          |            |            |      |   |      |   |
|                    | Rated Voltage                                                                                                  | Test Voltage                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | DC50V, DC100V                                                                                                  | 200% of the rated voltage                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | DC250V                                                                                                         | 150% of the rated voltage                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
|                    | DC630V, DC1kV                                                                                                  | 120% of the rated voltage                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| Appearance         | No defects or abnormalities                                                                                    |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| Capacitance Change | Within ±3% or ±0.3pF (Whichever is larger)                                                                     |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| Q                  | 30pF ≤ C: Q ≥ 350<br>10pF ≤ C < 30pF: Q ≥ 275+5C/2<br>10pF > C: Q ≥ 200+10C<br><br>C: Nominal Capacitance (pF) |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |
| I.R.               | 1000MΩ or 50MΩ • μF min. (Whichever is smaller)                                                                |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |              |               |                           |        |                           |               |                           |          |            |            |      |   |      |   |

\* "room condition" Temperature:  $15$  to  $35^\circ\text{C}$ , Relative humidity:  $45$  to  $75\%$ , Atmosphere pressure:  $86$  to  $106\text{kPa}$

Continued on the following page. ↗

## Temperature Compensating Type Specifications and Test Methods

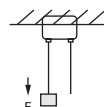
Continued from the preceding page. ↘

| No.          | AEC-Q200 Test Item                                   | Specifications                                                                                      | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7            | External Visual                                      | No defects or abnormalities                                                                         | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                         |
| 8            | Physical Dimension                                   | Within the specified dimensions                                                                     | Using calipers and micrometers                                                                                                                                                                                                                                                                                                                                                                            |
| 9            | Marking                                              | To be easily legible                                                                                | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                         |
| 10           | Resistance to Solvents                               | Appearance                                                                                          | Per MIL-STD-202 Method 215<br>Solvent 1: 1 part (by volume) of isopropyl alcohol<br>3 parts (by volume) of mineral spirits<br>Solvent 2: Terpene defluxer<br>Solvent 3: 42 parts (by volume) of water<br>1 part (by volume) of propylene glycol monomethyl ether<br>1 part (by volume) of monoethanolamine                                                                                                |
|              |                                                      | Capacitance                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Q                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | I.R.                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 11           | Mechanical Shock                                     | Appearance                                                                                          | Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks). The specified test pulse should be Half-sine and should have a duration: 0.5ms, peak value: 1500G and velocity change: 4.7m/s.                                                                                                                                                     |
|              |                                                      | Capacitance                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Q                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | I.R.                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 12           | Vibration                                            | Appearance                                                                                          | The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 2000Hz. The frequency range, from 10 to 2000Hz and return to 10Hz, should be traversed in approximately 20min. This motion should be applied for 12 items in each 3 mutually perpendicular directions (total of 36 times). |
|              |                                                      | Capacitance                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Q                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | I.R.                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>,<br>1 | Resistance to Soldering Heat (Non-Preheat)           | The measured and observed characteristics should satisfy the specifications in the following table. | The lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 10±1s. Post-treatment Capacitor should be stored for 24±2h at room condition*.                                                                                                                                                                                                               |
|              |                                                      | Appearance                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Capacitance Change                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                             |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>,<br>2 | Resistance to Soldering Heat (On-Preheat)            | The measured and observed characteristics should satisfy the specifications in the following table. | First the capacitor should be stored at 120+0/-5°C for 60+0/-5s. Then, the lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s. Post-treatment Capacitor should be stored for 24±2h at room condition*.                                                                                                                                    |
|              |                                                      | Appearance                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Capacitance Change                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                             |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>,<br>3 | Resistance to Soldering Heat (soldering iron method) | The measured and observed characteristics should satisfy the specifications in the following table. | Test condition<br>Temperature of iron-tip: 350±10°C<br>Soldering time: 3.5±0.5s<br>Soldering position<br>Straight Lead: 1.5 to 2.0mm from the root of terminal.<br>Crimp Lead: 1.5 to 2.0mm from the end of lead bend.<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                                                                                                      |
|              |                                                      | Appearance                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Capacitance Change                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                             |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 14           | Thermal Shock                                        | The measured and observed characteristics should satisfy the specifications in the following table. | Perform the 300 cycles according to the two heat treatments listed in the following table (Maximum transfer time is 20s). Let sit for 24±2h at room condition*, then measure.                                                                                                                                                                                                                             |
|              |                                                      | Appearance                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Capacitance Change                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Q                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | I.R.                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                           |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

## Temperature Compensating Type Specifications and Test Methods

Continued from the preceding page. ↘

| No.                          | AEC-Q200 Test Item               |                                                      | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                  |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|------------------------------|----------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------|------------------------------|---------------------------|---------------|---------------------------|----------|---------------------------|------------|---------------------------|-------------------|
| 15                           | ESD                              | Appearance                                           | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      | Per AEC-Q200-002                                                                                                                                                                                                                                                                                                      |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|                              |                                  | Capacitance                                          | Within the specified tolerance                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|                              |                                  | Q                                                    | 30pF ≤ C: Q ≥ 1000<br>30pF > C: Q ≥ 400+20C<br><br>C: Nominal Capacitance (pF)                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|                              |                                  | I.R.                                                 | More than 10000MΩ or 500MΩ • μF (Whichever is smaller)                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| 16                           | Solderability                    |                                                      | Lead wire should be soldered with uniform coating on the axial direction over 95% of the circumferential direction.                                                                                                                                                                                                                                                                                                                                                                |                      | Should be placed into steam aging for 8h±15min.<br>The terminal of capacitor is dipped into a solution of ethanol (JIS K 8101) and rosin (JIS K 5902) (25% rosin in weight propotion). Immerse in solder solution for 2±0.5s.<br>In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body. |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| 17                           | Electrical Charac-<br>terization | Appearance                                           | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      | Visual inspection                                                                                                                                                                                                                                                                                                     |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|                              |                                  | Capacitance                                          | Within the specified tolerance                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      | The capacitance, Q should be measured at 25°C at the frequency and voltage shown in the table.                                                                                                                                                                                                                        |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|                              |                                  | Q                                                    | 30pF ≤ C: Q ≥ 1000<br>30pF > C: Q ≥ 400+20C<br><br>C: Nominal Capacitance (pF)                                                                                                                                                                                                                                                                                                                                                                                                     |                      | <table><tr><th>Nominal Cap.</th><th>Frequency</th><th>Voltage</th></tr><tr><td>C ≤ 1000pF</td><td>1±0.1MHz</td><td>AC0.5 to 5V (r.m.s.)</td></tr><tr><td>C &gt; 1000pF</td><td>1±0.1kHz</td><td>AC1±0.2V (r.m.s.)</td></tr></table>                                                                                   |               |                   | Nominal Cap.                 | Frequency                 | Voltage       | C ≤ 1000pF                | 1±0.1MHz | AC0.5 to 5V (r.m.s.)      | C > 1000pF | 1±0.1kHz                  | AC1±0.2V (r.m.s.) |
|                              |                                  | Nominal Cap.                                         | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Voltage              |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|                              |                                  | C ≤ 1000pF                                           | 1±0.1MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | AC0.5 to 5V (r.m.s.) |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|                              |                                  | C > 1000pF                                           | 1±0.1kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | AC1±0.2V (r.m.s.)    |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| I.R.                         | Between Terminals                | 10000MΩ or 500MΩ • μF min.<br>(Whichever is smaller) | The insulation resistance should be measured with a DC voltage shown in the table at 25°C within 2min of charging.                                                                                                                                                                                                                                                                                                                                                                 |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| Dielectric Strength          | Between Terminals                | No defects or abnormalities                          | <table><tr><th>Rated Voltage</th><th>Measuring Voltage</th></tr><tr><td>DC25V, DC50V, DC100V, DC250V</td><td>Rated Voltage</td></tr><tr><td>DC630V, DC1kV</td><td>DC500V</td></tr></table>                                                                                                                                                                                                                                                                                         |                      |                                                                                                                                                                                                                                                                                                                       | Rated Voltage | Measuring Voltage | DC25V, DC50V, DC100V, DC250V | Rated Voltage             | DC630V, DC1kV | DC500V                    |          |                           |            |                           |                   |
|                              | Rated Voltage                    | Measuring Voltage                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| DC25V, DC50V, DC100V, DC250V | Rated Voltage                    |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| DC630V, DC1kV                | DC500V                           |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| Dielectric Strength          | Body Insulation                  | No defects or abnormalities                          | The capacitor should not be damaged when DC voltage shown in the table is applied between the terminations for 1 to 5s.<br>(Charge/Discharge current ≤ 50mA.)<br><table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC50V, DC100V</td><td>300% of the rated voltage</td></tr><tr><td>DC250V</td><td>200% of the rated voltage</td></tr><tr><td>DC630V</td><td>150% of the rated voltage</td></tr><tr><td>DC1kV</td><td>130% of the rated voltage</td></tr></table> |                      |                                                                                                                                                                                                                                                                                                                       | Rated Voltage | Test Voltage      | DC50V, DC100V                | 300% of the rated voltage | DC250V        | 200% of the rated voltage | DC630V   | 150% of the rated voltage | DC1kV      | 130% of the rated voltage |                   |
|                              | Rated Voltage                    | Test Voltage                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| DC50V, DC100V                | 300% of the rated voltage        |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| DC250V                       | 200% of the rated voltage        |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| DC630V                       | 150% of the rated voltage        |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| DC1kV                        | 130% of the rated voltage        |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                                                                                       |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
| 18                           | Terminal Strength                | Tensile Strength                                     | Termination not to be broken or loosened                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1s.<br>                                      |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |
|                              |                                  | Bending Strength                                     | Termination not to be broken or loosened                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | Each lead wire should be subjected to a force of 2.5N and then be bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3s.                                                                   |               |                   |                              |                           |               |                           |          |                           |            |                           |                   |

Continued on the following page. ↗

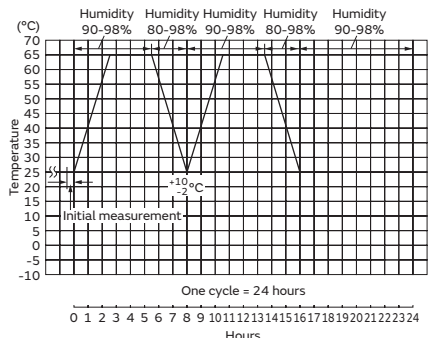
## Temperature Compensating Type Specifications and Test Methods

Continued from the preceding page. ↘

| No.   | AEC-Q200 Test Item                                                                                                                                                                                                                                        | Specifications | AEC-Q200 Test Method                                                                                                                                                                                                             |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------|-----|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---|------|---|-------|---|------|
| 19    | Capacitance Temperature Characteristics                                                                                                                                                                                                                   |                | The capacitance change should be measured after 5min at each specified temperature step.                                                                                                                                         |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
|       |                                                                                                                                                                                                                                                           |                | <table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>125±3</td></tr><tr><td>5</td><td>25±2</td></tr></table> | Step | Temperature (°C)                                       | 1   | 25±2                                                            | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -55±3 | 3 | 25±2 | 4 | 125±3 | 5 | 25±2 |
|       |                                                                                                                                                                                                                                                           | Step           | Temperature (°C)                                                                                                                                                                                                                 |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
|       |                                                                                                                                                                                                                                                           | 1              | 25±2                                                                                                                                                                                                                             |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
| 2     | -55±3                                                                                                                                                                                                                                                     |                |                                                                                                                                                                                                                                  |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
| 3     | 25±2                                                                                                                                                                                                                                                      |                |                                                                                                                                                                                                                                  |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
| 4     | 125±3                                                                                                                                                                                                                                                     |                |                                                                                                                                                                                                                                  |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
| 5     | 25±2                                                                                                                                                                                                                                                      |                |                                                                                                                                                                                                                                  |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
|       | <table><tr><th>Char.</th><th>Temperature Coefficient</th></tr><tr><td>C0G</td><td>25 to 125°C: 0±30ppm/°C<br/>-55 to 25°C: 0+30/-72ppm/°C</td></tr><tr><td>U2J</td><td>25 to 125°C: -750±120ppm/°C<br/>-55 to 25°C: -750+120/-347ppm/°C</td></tr></table> | Char.          | Temperature Coefficient                                                                                                                                                                                                          | C0G  | 25 to 125°C: 0±30ppm/°C<br>-55 to 25°C: 0+30/-72ppm/°C | U2J | 25 to 125°C: -750±120ppm/°C<br>-55 to 25°C: -750+120/-347ppm/°C | The temperature coefficient is determined using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5 (-55 to +125°C) the capacitance should be within the specified tolerance for the temperature coefficient.<br>The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in the step 1, 3 and 5 by the capacitance value in step 3. |       |   |      |   |       |   |      |
| Char. | Temperature Coefficient                                                                                                                                                                                                                                   |                |                                                                                                                                                                                                                                  |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
| C0G   | 25 to 125°C: 0±30ppm/°C<br>-55 to 25°C: 0+30/-72ppm/°C                                                                                                                                                                                                    |                |                                                                                                                                                                                                                                  |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
| U2J   | 25 to 125°C: -750±120ppm/°C<br>-55 to 25°C: -750+120/-347ppm/°C                                                                                                                                                                                           |                |                                                                                                                                                                                                                                  |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |
|       |                                                                                                                                                                                                                                                           |                |                                                                                                                                                                                                                                  |      |                                                        |     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |   |      |   |       |   |      |

## High Dielectric Constant Type Specifications and Test Methods

1

| No.                | AEC-Q200 Test Item                              | Specifications                                                                                      | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|--------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|------------|---|---|------------|----------|------------|----------|------------|------------|------|---|------|---|
| 1                  | Pre-and Post-Stress Electrical Test             | -                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 2                  | High Temperature Exposure (Storage)             | The measured and observed characteristics should satisfy the specifications in the following table. | Sit the capacitor for 1000±12h at 150±3°C. Let sit for 24±2h at room condition*, then measure.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*.                                                                                                                                                                                                                                                                                                            |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Appearance                                      | No defects or abnormalities                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Capacitance Change                              | Within ±12.5%                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | D.F.                                            | 0.04 max.                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | I.R.                                            | More than 1000MΩ or 50MΩ • μF (Whichever is smaller)                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 3                  | Temperature Cycling                             | The measured and observed characteristics should satisfy the specifications in the following table. | Perform the 1000 cycles according to the four heat treatments listed in the following table. Let sit for 24±2h at room condition*, then measure. <table><tr><th>Step</th><th>1</th><th>2</th><th>3</th><th>4</th></tr><tr><td>Temp. (°C)</td><td>-55+0/-3</td><td>Room Temp.</td><td>125+3/-0</td><td>Room Temp.</td></tr><tr><td>Time (min)</td><td>15±3</td><td>1</td><td>15±3</td><td>1</td></tr></table> •Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*. | Step       | 1        | 2          | 3 | 4 | Temp. (°C) | -55+0/-3 | Room Temp. | 125+3/-0 | Room Temp. | Time (min) | 15±3 | 1 | 15±3 | 1 |
|                    | Step                                            | 1                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2          | 3        | 4          |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Temp. (°C)                                      | -55+0/-3                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Room Temp. | 125+3/-0 | Room Temp. |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Time (min)                                      | 15±3                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1          | 15±3     | 1          |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Appearance                                      | No defects or abnormalities                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| Capacitance Change | Within ±12.5%                                   |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| D.F.               | 0.05 max.                                       |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| I.R.               | 1000MΩ or 50MΩ • μF min. (Whichever is smaller) |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 4                  | Moisture Resistance                             | The measured and observed characteristics should satisfy the specifications in the following table. | Apply the 24h heat (25 to 65°C) and humidity (80 to 98%) treatment shown below, 10 consecutive times.<br>Let sit for 24±2h at room condition*, then measure.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*. <div></div>                                                                                                                                               |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Appearance                                      | No defects or abnormalities                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Capacitance Change                              | Within ±12.5%                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | D.F.                                            | 0.05 max.                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | I.R.                                            | 500MΩ or 25MΩ • μF min. (Whichever is smaller)                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 5                  | Biased Humidity                                 | The measured and observed characteristics should satisfy the specifications in the following table. | Apply the rated voltage and DC1.3+0.2/-0V (add 100kΩ resistor) at 85±3°C and 80 to 85% humidity for 1000±12h.<br>Remove and let sit for 24±2h at room condition*, then measure.<br>The charge/discharge current is less than 50mA.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*.                                                                                                                                                                        |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Appearance                                      | No defects or abnormalities                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | Capacitance Change                              | Within ±12.5%                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | D.F.                                            | 0.05 max.                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    | I.R.                                            | 500MΩ or 25MΩ • μF min. (Whichever is smaller)                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

## High Dielectric Constant Type Specifications and Test Methods

Continued from the preceding page. ↘

| No.          | AEC-Q200 Test Item                         |                                                 | Specifications                                                                                                                                                                                          | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |              |                      |                              |        |                           |        |                           |       |                           |
|--------------|--------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------|----------------------|------------------------------|--------|---------------------------|--------|---------------------------|-------|---------------------------|
| 6            | Operational Life                           |                                                 | The measured and observed characteristics should satisfy the specifications in the following table.                                                                                                     | <div>Apply the voltage shown in the table for 1000±12h at 125±3°C. Let sit for 24±2h at room condition*, then measure.</div> <div>The charge/discharge current is less than 50mA.</div> <div>•Pretreatment</div> <div>Apply test voltage for 60±5min at test temperature.</div> <div>Remove and let sit for 24±2h at room condition*.</div> <table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC25V, DC50V, DC100V</td><td>200% of the rated voltage *1</td></tr><tr><td>DC250V</td><td>150% of the rated voltage</td></tr><tr><td>DC630V</td><td>120% of the rated voltage</td></tr><tr><td>DC1kV</td><td>110% of the rated voltage</td></tr></table> | Rated Voltage | Test Voltage | DC25V, DC50V, DC100V | 200% of the rated voltage *1 | DC250V | 150% of the rated voltage | DC630V | 120% of the rated voltage | DC1kV | 110% of the rated voltage |
|              | Rated Voltage                              | Test Voltage                                    |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | DC25V, DC50V, DC100V                       | 200% of the rated voltage *1                    |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | DC250V                                     | 150% of the rated voltage                       |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | DC630V                                     | 120% of the rated voltage                       |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
| DC1kV        | 110% of the rated voltage                  |                                                 |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | Appearance                                 | No defects or abnormalities                     |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | Capacitance Change                         | Within ±12.5%                                   |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | D.F.                                       | 0.04 max.                                       |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | I.R.                                       | 1000MΩ or 50MΩ • μF min. (Whichever is smaller) |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
| 7            | External Visual                            |                                                 | No defects or abnormalities                                                                                                                                                                             | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |              |                      |                              |        |                           |        |                           |       |                           |
| 8            | Physical Dimension                         |                                                 | Within the specified dimensions                                                                                                                                                                         | Using calipers and micrometers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |              |                      |                              |        |                           |        |                           |       |                           |
| 9            | Marking                                    |                                                 | To be easily legible                                                                                                                                                                                    | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |              |                      |                              |        |                           |        |                           |       |                           |
| 10           | Resistance to Solvents                     | Appearance                                      | No defects or abnormalities                                                                                                                                                                             | <div>Per MIL-STD-202 Method 215</div> <div>Solvent 1: 1 part (by volume) of isopropyl alcohol<br/>3 parts (by volume) of mineral spirits</div> <div>Solvent 2: Terpene defluxer</div> <div>Solvent 3: 42 parts (by volume) of water<br/>1 part (by volume) of propylene glycol monomethyl ether<br/>1 part (by volume) of monoethanolamine</div>                                                                                                                                                                                                                                                                                                                        |               |              |                      |                              |        |                           |        |                           |       |                           |
|              |                                            | Capacitance                                     | Within the specified tolerance                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              |                                            | D.F.                                            | 0.025 max.                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              |                                            | I.R.                                            | Rated Voltage: DC25V, DC50V, DC100V<br>More than 10000MΩ or 500MΩ • μF (Whichever is smaller)<br>Rated Voltage: DC250V, DC500V, DC630V, DC1kV<br>More than 10000MΩ or 100MΩ • μF (Whichever is smaller) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
| 11           | Mechanical Shock                           | Appearance                                      | No defects or abnormalities                                                                                                                                                                             | <div>Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks).</div> <div>The specified test pulse should be Half-sine and should have a duration: 0.5ms, peak value: 1500G and velocity change: 4.7m/s.</div>                                                                                                                                                                                                                                                                                                                                                                                             |               |              |                      |                              |        |                           |        |                           |       |                           |
|              |                                            | Capacitance                                     | Within the specified tolerance                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              |                                            | D.F.                                            | 0.025 max.                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
| 12           | Vibration                                  | Appearance                                      | No defects or abnormalities                                                                                                                                                                             | <div>The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 2000Hz.</div> <div>The frequency range, from 10 to 2000Hz and return to 10Hz, should be traversed in approximately 20min. This motion should be applied for 12 items in each 3 mutually perpendicular directions (total of 36 times).</div>                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              |                                            | Capacitance                                     | Within the specified tolerance                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              |                                            | D.F.                                            | 0.025 max.                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
| 13<br>,<br>1 | Resistance to Soldering Heat (Non-Preheat) |                                                 | The measured and observed characteristics should satisfy the specifications in the following table.                                                                                                     | <div>The lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 10±1s.</div> <div>Pre-treatment</div> <div>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement.</div> <div>Post-treatment</div> <div>Capacitor should be stored for 24±2h at room condition*.</div>                                                                                                                                                                                                                                                                                 |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | Appearance                                 | No defects or abnormalities                     |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | Capacitance Change                         | Within ±7.5%                                    |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | Dielectric Strength (Between Terminals)    | No defects                                      |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
| 13<br>,<br>2 | Resistance to Soldering Heat (On-Preheat)  |                                                 | The measured and observed characteristics should satisfy the specifications in the following table.                                                                                                     | <div>First the capacitor should be stored at 120+0/-5°C for 60+0/-5s. Then, the lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s.</div> <div>Pre-treatment</div> <div>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement.</div> <div>Post-treatment</div> <div>Capacitor should be stored for 24±2h at room condition*.</div>                                                                                                                                                                                                      |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | Appearance                                 | No defects or abnormalities                     |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | Capacitance Change                         | Within ±7.5%                                    |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |
|              | Dielectric Strength (Between Terminals)    | No defects                                      |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |                      |                              |        |                           |        |                           |       |                           |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

\*1: below parts are applicable in rated voltage×150%.

| Char. | Rated Voltage | Capacitance | Dimensions |
|-------|---------------|-------------|------------|
| C7    | 1H            | 105         | 1          |
| C7    | 1H            | 475         | 2          |
| C7    | 1H            | 106         | 3          |
| C7    | 1H            | 226         | W          |
| R7    | 2A            | 334         | 1          |
| R7    | 2A            | 474-105     | 2          |
| C7    | 2A            | 155-225     | 3          |
| C7    | 2A            | 475         | W          |

Continued on the following page. ↗

## High Dielectric Constant Type Specifications and Test Methods

Continued from the preceding page. ↘

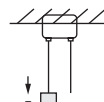
| No.                  | AEC-Q200 Test Item                                      |                                         | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                         | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                             |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|----------------------|---------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--|---------------|----------------------|-------------------|------------------------------|----------|---------------------|---------------------------|---------------|---------------------|---------------------------|-------|--|---------------------------|
| 13<br>,<br>3         | Resistance to Soldering Heat<br>(Soldering Iron Method) |                                         | The measured and observed characteristics should satisfy the specifications in the following table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                         | Test condition<br>Temperature of iron-tip: 350±10°C<br>Soldering time: 3.5±0.5s.<br>Soldering position<br>Straight Lead: 1.5 to 2.0mm from the root of terminal.<br>Crimp Lead: 1.5 to 2.0mm from the end of lead bend.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement.<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*. |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | Appearance                              | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | Capacitance Change                      | Within ±7.5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | Dielectric Strength (Between Terminals) | No defects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| 14                   | Thermal Shock                                           |                                         | The measured and observed characteristics should satisfy the specifications in the following table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                         | Perform the 300 cycles according to the two heat treatments listed in the following table (Maximum transfer time is 20s).<br>Let sit for 24±2h at room condition*, then measure. <table><tr><th>Step</th><th>1</th><th>2</th></tr><tr><td>Temp. (°C)</td><td>-55+0/-3</td><td>125+3/-0</td></tr><tr><td>Time (min)</td><td>15±3</td><td>15±3</td></tr></table>                                                                                   |               |  | Step          | 1                    | 2                 | Temp. (°C)                   | -55+0/-3 | 125+3/-0            | Time (min)                | 15±3          | 15±3                |                           |       |  |                           |
|                      |                                                         | Step                                    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | Temp. (°C)                              | -55+0/-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 125+3/-0                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | Time (min)                              | 15±3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15±3                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | Appearance                              | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| Capacitance Change   | Within ±12.5%                                           |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| D.F.                 | 0.05 max.                                               |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| I.R.                 | 1000MΩ or 50MΩ • μF min. (Whichever is smaller)         |                                         | •Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| 15                   | ESD                                                     | Appearance                              | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                         | Per AEC-Q200-002                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | Capacitance                             | Within the specified tolerance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | D.F.                                    | 0.025 max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | I.R.                                    | Rated Voltage: DC25V, DC50V, DC100V<br>More than 10000MΩ or 500MΩ • μF (Whichever is smaller)<br>Rated Voltage: DC250V, DC500V, DC630V, DC1kV<br>More than 10000MΩ or 100MΩ • μF (Whichever is smaller)                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| 16                   | Solderability                                           |                                         | Lead wire should be soldered with uniform coating on the axial direction over 95% of the circumferential direction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                         | Should be placed into steam aging for 8h±15min.<br>The terminal of capacitor is dipped into a solution of ethanol (JIS K 8101) and rosin (JIS K 5902) (25% rosin in weight propotion). Immerse in solder solution for 2±0.5s.<br>In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body.                                                                                                                            |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| 17                   | Electrical Charac-<br>terization                        | Appearance                              | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                         | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | Capacitance                             | Within the specified tolerance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                         | The capacitance/D.F. should be measured at 25°C at the frequency and voltage shown in the table. <table><tr><th>Nominal Cap.</th><th>Frequency</th><th>Voltage</th></tr><tr><td>C ≤ 10μF</td><td>1±0.1kHz</td><td>AC1.0±0.2V (r.m.s.)</td></tr><tr><td>C &gt; 10μF</td><td>120±24kHz</td><td>AC0.5±0.1V (r.m.s.)</td></tr></table>                                                                                                               |               |  | Nominal Cap.  | Frequency            | Voltage           | C ≤ 10μF                     | 1±0.1kHz | AC1.0±0.2V (r.m.s.) | C > 10μF                  | 120±24kHz     | AC0.5±0.1V (r.m.s.) |                           |       |  |                           |
|                      |                                                         | Nominal Cap.                            | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Voltage                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | C ≤ 10μF                                | 1±0.1kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | AC1.0±0.2V (r.m.s.)                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | C > 10μF                                | 120±24kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | AC0.5±0.1V (r.m.s.)                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | D.F.                                    | 0.025 max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | I.R.                                    | Between Terminals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Rated Voltage: DC25V, DC50V, DC100V<br>More than 10000MΩ or 500MΩ • μF (Whichever is smaller)<br>Rated Voltage: DC250V, DC500V, DC630V, DC1kV<br>More than 10000MΩ or 100MΩ • μF (Whichever is smaller) | The insulation resistance should be measured with a DC voltage shown in the table at 25°C within 2min of charging. <table><tr><th colspan="2">Rated Voltage</th><th>Measuring Voltage</th></tr><tr><td colspan="2">DC25V, DC50V, DC100V, DC250V</td><td>Rated Voltage</td></tr><tr><td colspan="2">DC630V, DC1kV</td><td>DC500V</td></tr></table>                                                                                                |               |  | Rated Voltage |                      | Measuring Voltage | DC25V, DC50V, DC100V, DC250V |          | Rated Voltage       | DC630V, DC1kV             |               | DC500V              |                           |       |  |                           |
|                      |                                                         | Rated Voltage                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Measuring Voltage                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | DC25V, DC50V, DC100V, DC250V            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Rated Voltage                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         | DC630V, DC1kV                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | DC500V                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      | Between Terminals                                       | No defects or abnormalities             | The capacitor should not be damaged when DC voltage shown in the table is applied between the terminations for 1 to 5s.<br>(Charge/Discharge current ≤ 50mA.) <table><tr><th colspan="2">Rated Voltage</th><th>Test Voltage</th></tr><tr><td colspan="2">DC25V, DC50V, DC100V</td><td>250% of the rated voltage</td></tr><tr><td colspan="2">DC250V</td><td>200% of the rated voltage</td></tr><tr><td colspan="2">DC630V</td><td>150% of the rated voltage</td></tr><tr><td colspan="2">DC1kV</td><td>120% of the rated voltage</td></tr></table>                                                                          |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Rated Voltage |  | Test Voltage  | DC25V, DC50V, DC100V |                   | 250% of the rated voltage    | DC250V   |                     | 200% of the rated voltage | DC630V        |                     | 150% of the rated voltage | DC1kV |  | 120% of the rated voltage |
| Rated Voltage        |                                                         | Test Voltage                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| DC25V, DC50V, DC100V |                                                         | 250% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| DC250V               |                                                         | 200% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| DC630V               |                                                         | 150% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| DC1kV                |                                                         | 120% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      | Dielectric Strength                                     |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      | Body Insulation                                         | No defects or abnormalities             | The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuit is kept approximately 2mm from the balls, and 250% of the rated DC voltage shown in the table is impressed for 1 to 5s between capacitor terminals and metal balls.<br>(Charge/Discharge current ≤ 50mA.) <table><tr><th colspan="2">Rated Voltage</th><th>Test Voltage</th></tr><tr><td colspan="2">DC25V, DC50V, DC100V</td><td>250% of the rated voltage</td></tr><tr><td colspan="2">DC250V</td><td>200% of the rated voltage</td></tr><tr><td colspan="2">DC630V, DC1kV</td><td>DC1300V</td></tr></table> |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Rated Voltage |  | Test Voltage  | DC25V, DC50V, DC100V |                   | 250% of the rated voltage    | DC250V   |                     | 200% of the rated voltage | DC630V, DC1kV |                     | DC1300V                   |       |  |                           |
| Rated Voltage        |                                                         | Test Voltage                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| DC25V, DC50V, DC100V |                                                         | 250% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| DC250V               |                                                         | 200% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
| DC630V, DC1kV        |                                                         | DC1300V                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |
|                      |                                                         |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |  |               |                      |                   |                              |          |                     |                           |               |                     |                           |       |  |                           |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

## High Dielectric Constant Type Specifications and Test Methods

Continued from the preceding page. ↘

| No.  | AEC-Q200 Test Item                      |                  | Specifications                                           | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |                  |   |      |   |       |   |      |   |       |   |      |
|------|-----------------------------------------|------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|---|------|---|-------|---|------|---|-------|---|------|
| 18   | Terminal Strength                       | Tensile Strength | Termination not to be broken or loosened                 | <p>As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1s.</p>                                                                                                                                                                                                                                                                                                                                                                                    |      |                  |   |      |   |       |   |      |   |       |   |      |
|      |                                         | Bending Strength | Termination not to be broken or loosened                 | <p>Each lead wire should be subjected to a force of 2.5N and then be bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3s.</p>                                                                                                                                                                                                                                                                                                                                                                                                           |      |                  |   |      |   |       |   |      |   |       |   |      |
| 19   | Capacitance Temperature Characteristics |                  | <p>Char. X7R: Within ±15%<br/>Char. X7S: Within ±22%</p> | <p>The capacitance change should be measured after 5min at each specified temperature step.</p> <table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>125±3</td></tr><tr><td>5</td><td>25±2</td></tr></table> <p>The ranges of capacitance change compared with the above 25°C value over the temperature ranges shown in the table should be within the specified ranges.</p> <p>•Pretreatment<br/>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*.<br/>Perform the initial measurement.</p> | Step | Temperature (°C) | 1 | 25±2 | 2 | -55±3 | 3 | 25±2 | 4 | 125±3 | 5 | 25±2 |
| Step | Temperature (°C)                        |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 1    | 25±2                                    |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 2    | -55±3                                   |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 3    | 25±2                                    |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 4    | 125±3                                   |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 5    | 25±2                                    |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

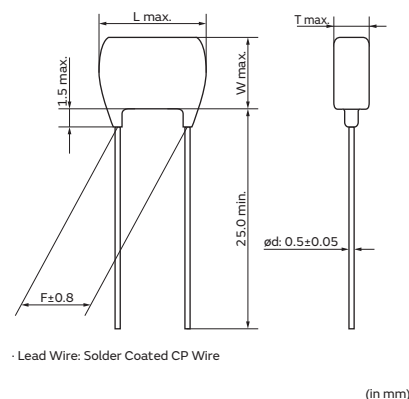
# 150°C Operation Leaded MLCC for Automotive

## RHE Series (DC25V-DC100V)

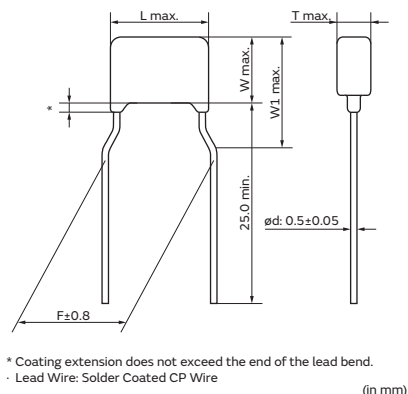
### Features

1. Small size and large capacitance
2. Low ESR and ESL suitable for high frequency
3. Applied maximum temperature up to 150°C  
Note: Maximum accumulative time to 150°C is within 2000 hours.
4. Meet AEC-Q200, ISO7637-2 (surge test) requirement
5. Meet LF (Lead Free) and HF (Halogen Free)
6. Flow soldering and welding are available.  
(Re-flow soldering is not available.)
7. If copper wire is necessary at welding process, copper wire is available based on request.

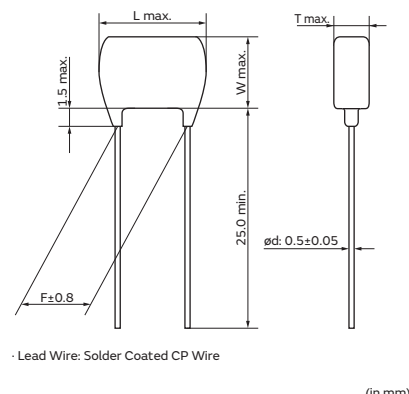
Dimensions code: 0  
Lead style code: A2



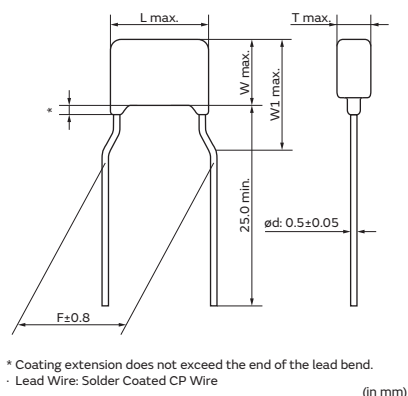
Dimensions code: 0  
Lead style code: K1



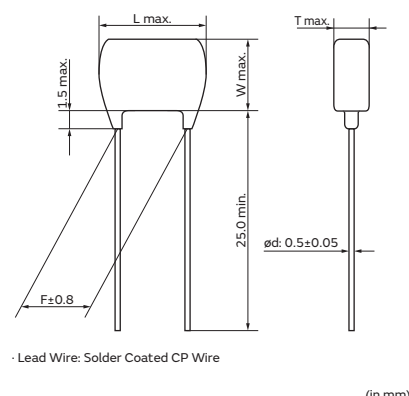
Dimensions code: 1  
Lead style code: A2



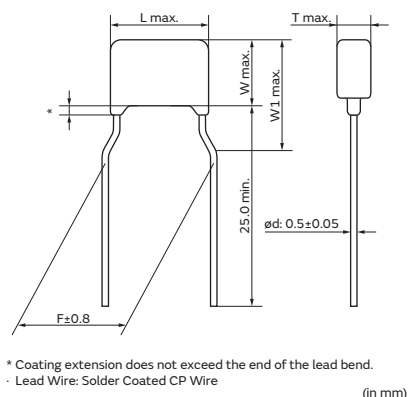
Dimensions code: 1  
Lead style code: K1



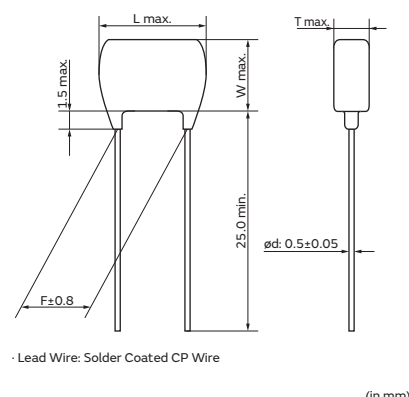
Dimensions code: 2  
Lead style code: A2



Dimensions code: 2  
Lead style code: K1

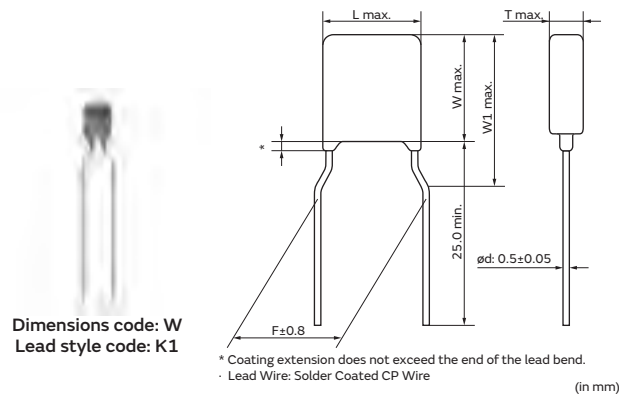
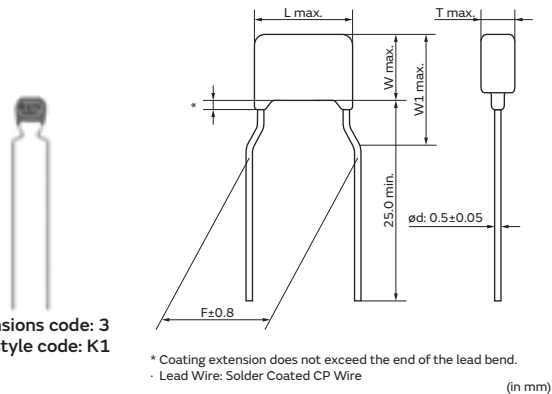


Dimensions code: 3  
Lead style code: A2



Continued on the following page. ↗

Continued from the preceding page. ➡



## Dimensions

| Dimensions and Lead Style Code | Dimensions (mm) |     |      |                                          |     |     |
|--------------------------------|-----------------|-----|------|------------------------------------------|-----|-----|
|                                | L               | W   | W1   | T                                        | F   | d   |
| 0A2/0DB                        | 3.6             | 3.5 | -    | See the individual product specification | 2.5 | 0.5 |
| 0K1/0M1                        | 3.6             | 3.5 | 6.0  |                                          | 5.0 | 0.5 |
| 1A2/1DB                        | 4.0             | 3.5 | -    |                                          | 2.5 | 0.5 |
| 1K1/1M1                        | 4.0             | 3.5 | 5.0  |                                          | 5.0 | 0.5 |
| 2A2/2DB                        | 5.5             | 4.0 | -    |                                          | 2.5 | 0.5 |
| 2K1/2M1                        | 5.5             | 4.0 | 6.0  |                                          | 5.0 | 0.5 |
| 3A2/3DB                        | 5.5             | 5.0 | -    |                                          | 2.5 | 0.5 |
| 3K1/3M1                        | 5.5             | 5.0 | 7.5  |                                          | 5.0 | 0.5 |
| WK1/WM1                        | 5.5             | 7.5 | 10.0 |                                          | 5.0 | 0.5 |

## Marking

| Dimensions Code               | Type          | Temperature Compensating Type                                                                                | High Dielectric Constant Type |              |
|-------------------------------|---------------|--------------------------------------------------------------------------------------------------------------|-------------------------------|--------------|
|                               | Rated Voltage | DC50V, DC100V                                                                                                | DC25V, DC50V                  | DC100V       |
|                               | Temp. Char.   | X8G                                                                                                          | X8L                           |              |
| 0                             |               | 8<br>102J                                                                                                    | 8<br>104K                     | 8<br>103K    |
| 1                             |               |                                                                                                              |                               |              |
| 2                             |               | —                                                                                                            | Ⓜ 105<br>K58                  | Ⓜ 224<br>K18 |
| 3, W                          |               | —                                                                                                            | Ⓜ 335<br>K58                  | —            |
| Temperature Characteristics   |               | Marked with code (X8G, X8L char.: 8)                                                                         |                               |              |
| Nominal Capacitance           |               | Marked with 3 figures                                                                                        |                               |              |
| Capacitance Tolerance         |               | Marked with code                                                                                             |                               |              |
| Rated Voltage                 |               | Marked with code (DC25V: 2, DC50V: 5, DC100V: 1)<br>A part is omitted (Please refer to the marking example.) |                               |              |
| Manufacturer's Identification |               | Marked with Ⓜ<br>A part is omitted (Please refer to the marking example.)                                    |                               |              |

## Temperature Compensating Type, X8G Characteristics

| Part Number        | Temp. Char.  | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|--------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RHE5G1H101J0□□H03□ | X8G (Murata) | 50Vdc         | 100pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H101J0□□H03□ | X8G (Murata) | 50Vdc         | 100pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H121J0□□H03□ | X8G (Murata) | 50Vdc         | 120pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H121J0□□H03□ | X8G (Murata) | 50Vdc         | 120pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H151J0□□H03□ | X8G (Murata) | 50Vdc         | 150pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H151J0□□H03□ | X8G (Murata) | 50Vdc         | 150pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H181J0□□H03□ | X8G (Murata) | 50Vdc         | 180pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H181J0□□H03□ | X8G (Murata) | 50Vdc         | 180pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H221J0□□H03□ | X8G (Murata) | 50Vdc         | 220pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H221J0□□H03□ | X8G (Murata) | 50Vdc         | 220pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H271J0□□H03□ | X8G (Murata) | 50Vdc         | 270pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H271J0□□H03□ | X8G (Murata) | 50Vdc         | 270pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H331J0□□H03□ | X8G (Murata) | 50Vdc         | 330pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H331J0□□H03□ | X8G (Murata) | 50Vdc         | 330pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H391J0□□H03□ | X8G (Murata) | 50Vdc         | 390pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H391J0□□H03□ | X8G (Murata) | 50Vdc         | 390pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H471J0□□H03□ | X8G (Murata) | 50Vdc         | 470pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H471J0□□H03□ | X8G (Murata) | 50Vdc         | 470pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H561J0□□H03□ | X8G (Murata) | 50Vdc         | 560pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H561J0□□H03□ | X8G (Murata) | 50Vdc         | 560pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H681J0□□H03□ | X8G (Murata) | 50Vdc         | 680pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H681J0□□H03□ | X8G (Murata) | 50Vdc         | 680pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H821J0□□H03□ | X8G (Murata) | 50Vdc         | 820pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H821J0□□H03□ | X8G (Murata) | 50Vdc         | 820pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H102J0□□H03□ | X8G (Murata) | 50Vdc         | 1000pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H102J0□□H03□ | X8G (Murata) | 50Vdc         | 1000pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H122J0□□H03□ | X8G (Murata) | 50Vdc         | 1200pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H122J0□□H03□ | X8G (Murata) | 50Vdc         | 1200pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H152J0□□H03□ | X8G (Murata) | 50Vdc         | 1500pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H152J0□□H03□ | X8G (Murata) | 50Vdc         | 1500pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H182J0□□H03□ | X8G (Murata) | 50Vdc         | 1800pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H182J0□□H03□ | X8G (Murata) | 50Vdc         | 1800pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H222J0□□H03□ | X8G (Murata) | 50Vdc         | 2200pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H222J0□□H03□ | X8G (Murata) | 50Vdc         | 2200pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H272J0□□H03□ | X8G (Murata) | 50Vdc         | 2700pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H272J0□□H03□ | X8G (Murata) | 50Vdc         | 2700pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H332J0□□H03□ | X8G (Murata) | 50Vdc         | 3300pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H332J0□□H03□ | X8G (Murata) | 50Vdc         | 3300pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H392J0□□H03□ | X8G (Murata) | 50Vdc         | 3900pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H392J0□□H03□ | X8G (Murata) | 50Vdc         | 3900pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H472J1□□H03□ | X8G (Murata) | 50Vdc         | 4700pF±5%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H472J1□□H03□ | X8G (Murata) | 50Vdc         | 4700pF±5%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H562J1□□H03□ | X8G (Murata) | 50Vdc         | 5600pF±5%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H562J1□□H03□ | X8G (Murata) | 50Vdc         | 5600pF±5%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H682J1□□H03□ | X8G (Murata) | 50Vdc         | 6800pF±5%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H682J1□□H03□ | X8G (Murata) | 50Vdc         | 6800pF±5%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H822J1□□H03□ | X8G (Murata) | 50Vdc         | 8200pF±5%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H822J1□□H03□ | X8G (Murata) | 50Vdc         | 8200pF±5%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G1H103J1□□H03□ | X8G (Murata) | 50Vdc         | 10000pF±5%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G1H103J1□□H03□ | X8G (Murata) | 50Vdc         | 10000pF±5%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A101J0□□H03□ | X8G (Murata) | 100Vdc        | 100pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A101J0□□H03□ | X8G (Murata) | 100Vdc        | 100pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A121J0□□H03□ | X8G (Murata) | 100Vdc        | 120pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A121J0□□H03□ | X8G (Murata) | 100Vdc        | 120pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A151J0□□H03□ | X8G (Murata) | 100Vdc        | 150pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |

Continued on the following page. ➤

Continued from the preceding page. ➡

| Part Number        | Temp. Char.  | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|--------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RHE5G2A151J0□□H03□ | X8G (Murata) | 100Vdc        | 150pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A181J0□□H03□ | X8G (Murata) | 100Vdc        | 180pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A181J0□□H03□ | X8G (Murata) | 100Vdc        | 180pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A221J0□□H03□ | X8G (Murata) | 100Vdc        | 220pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A221J0□□H03□ | X8G (Murata) | 100Vdc        | 220pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A271J0□□H03□ | X8G (Murata) | 100Vdc        | 270pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A271J0□□H03□ | X8G (Murata) | 100Vdc        | 270pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A331J0□□H03□ | X8G (Murata) | 100Vdc        | 330pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A331J0□□H03□ | X8G (Murata) | 100Vdc        | 330pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A391J0□□H03□ | X8G (Murata) | 100Vdc        | 390pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A391J0□□H03□ | X8G (Murata) | 100Vdc        | 390pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A471J0□□H03□ | X8G (Murata) | 100Vdc        | 470pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A471J0□□H03□ | X8G (Murata) | 100Vdc        | 470pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A561J0□□H03□ | X8G (Murata) | 100Vdc        | 560pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A561J0□□H03□ | X8G (Murata) | 100Vdc        | 560pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A681J0□□H03□ | X8G (Murata) | 100Vdc        | 680pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A681J0□□H03□ | X8G (Murata) | 100Vdc        | 680pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A821J0□□H03□ | X8G (Murata) | 100Vdc        | 820pF±5%    | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A821J0□□H03□ | X8G (Murata) | 100Vdc        | 820pF±5%    | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A102J0□□H03□ | X8G (Murata) | 100Vdc        | 1000pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A102J0□□H03□ | X8G (Murata) | 100Vdc        | 1000pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A122J0□□H03□ | X8G (Murata) | 100Vdc        | 1200pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A122J0□□H03□ | X8G (Murata) | 100Vdc        | 1200pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A152J0□□H03□ | X8G (Murata) | 100Vdc        | 1500pF±5%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A152J0□□H03□ | X8G (Murata) | 100Vdc        | 1500pF±5%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A182J1□□H03□ | X8G (Murata) | 100Vdc        | 1800pF±5%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A182J1□□H03□ | X8G (Murata) | 100Vdc        | 1800pF±5%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A222J1□□H03□ | X8G (Murata) | 100Vdc        | 2200pF±5%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A222J1□□H03□ | X8G (Murata) | 100Vdc        | 2200pF±5%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A272J1□□H03□ | X8G (Murata) | 100Vdc        | 2700pF±5%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A272J1□□H03□ | X8G (Murata) | 100Vdc        | 2700pF±5%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHE5G2A332J1□□H03□ | X8G (Murata) | 100Vdc        | 3300pF±5%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHE5G2A332J1□□H03□ | X8G (Murata) | 100Vdc        | 3300pF±5%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## High Dielectric Constant Type, X8L Characteristics

| Part Number        | Temp. Char.  | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|--------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RHEL81E104K0□□H03□ | X8L (Murata) | 25Vdc         | 0.1μF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81E104K0□□H03□ | X8L (Murata) | 25Vdc         | 0.1μF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81E154K0□□H03□ | X8L (Murata) | 25Vdc         | 0.15μF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81E154K0□□H03□ | X8L (Murata) | 25Vdc         | 0.15μF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81E224K0□□H03□ | X8L (Murata) | 25Vdc         | 0.22μF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81E224K0□□H03□ | X8L (Murata) | 25Vdc         | 0.22μF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81E334K1□□H03□ | X8L (Murata) | 25Vdc         | 0.33μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81E334K1□□H03□ | X8L (Murata) | 25Vdc         | 0.33μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81E474K1□□H03□ | X8L (Murata) | 25Vdc         | 0.47μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81E474K1□□H03□ | X8L (Murata) | 25Vdc         | 0.47μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81E684K1□□H03□ | X8L (Murata) | 25Vdc         | 0.68μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81E684K1□□H03□ | X8L (Murata) | 25Vdc         | 0.68μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81E105K1□□H03□ | X8L (Murata) | 25Vdc         | 1.0μF±10%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81E105K1□□H03□ | X8L (Murata) | 25Vdc         | 1.0μF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81E155K2□□H03□ | X8L (Murata) | 25Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL81E155K2□□H03□ | X8L (Murata) | 25Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81E225K2□□H03□ | X8L (Murata) | 25Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp. Char.  | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|--------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RHEL81E225K2□□H03□ | X8L (Murata) | 25Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81E335K2□□H03□ | X8L (Murata) | 25Vdc         | 3.3μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL81E335K2□□H03□ | X8L (Murata) | 25Vdc         | 3.3μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81E475K2□□H03□ | X8L (Murata) | 25Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL81E475K2□□H03□ | X8L (Murata) | 25Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81E106K3□□H03□ | X8L (Murata) | 25Vdc         | 10μF±10%    | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RHEL81E106K3□□H03□ | X8L (Murata) | 25Vdc         | 10μF±10%    | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RHEL81E226MW□□H03□ | X8L (Murata) | 25Vdc         | 22μF±20%    | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RHEL81H221K0□□H03□ | X8L (Murata) | 50Vdc         | 220pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H221K0□□H03□ | X8L (Murata) | 50Vdc         | 220pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H331K0□□H03□ | X8L (Murata) | 50Vdc         | 330pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H331K0□□H03□ | X8L (Murata) | 50Vdc         | 330pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H471K0□□H03□ | X8L (Murata) | 50Vdc         | 470pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H471K0□□H03□ | X8L (Murata) | 50Vdc         | 470pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H681K0□□H03□ | X8L (Murata) | 50Vdc         | 680pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H681K0□□H03□ | X8L (Murata) | 50Vdc         | 680pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H102K0□□H03□ | X8L (Murata) | 50Vdc         | 1000pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H102K0□□H03□ | X8L (Murata) | 50Vdc         | 1000pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H152K0□□H03□ | X8L (Murata) | 50Vdc         | 1500pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H152K0□□H03□ | X8L (Murata) | 50Vdc         | 1500pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H222K0□□H03□ | X8L (Murata) | 50Vdc         | 2200pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H222K0□□H03□ | X8L (Murata) | 50Vdc         | 2200pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H332K0□□H03□ | X8L (Murata) | 50Vdc         | 3300pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H332K0□□H03□ | X8L (Murata) | 50Vdc         | 3300pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H472K0□□H03□ | X8L (Murata) | 50Vdc         | 4700pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H472K0□□H03□ | X8L (Murata) | 50Vdc         | 4700pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H682K0□□H03□ | X8L (Murata) | 50Vdc         | 6800pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H682K0□□H03□ | X8L (Murata) | 50Vdc         | 6800pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H103K0□□H03□ | X8L (Murata) | 50Vdc         | 10000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H103K0□□H03□ | X8L (Murata) | 50Vdc         | 10000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H153K0□□H03□ | X8L (Murata) | 50Vdc         | 15000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H153K0□□H03□ | X8L (Murata) | 50Vdc         | 15000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H223K0□□H03□ | X8L (Murata) | 50Vdc         | 22000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H223K0□□H03□ | X8L (Murata) | 50Vdc         | 22000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H333K0□□H03□ | X8L (Murata) | 50Vdc         | 33000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H333K0□□H03□ | X8L (Murata) | 50Vdc         | 33000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H473K0□□H03□ | X8L (Murata) | 50Vdc         | 47000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H473K0□□H03□ | X8L (Murata) | 50Vdc         | 47000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H683K0□□H03□ | X8L (Murata) | 50Vdc         | 68000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H683K0□□H03□ | X8L (Murata) | 50Vdc         | 68000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H104K0□□H03□ | X8L (Murata) | 50Vdc         | 0.10μF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H104K0□□H03□ | X8L (Murata) | 50Vdc         | 0.10μF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H154K1□□H03□ | X8L (Murata) | 50Vdc         | 0.15μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H154K1□□H03□ | X8L (Murata) | 50Vdc         | 0.15μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H224K1□□H03□ | X8L (Murata) | 50Vdc         | 0.22μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H224K1□□H03□ | X8L (Murata) | 50Vdc         | 0.22μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H334K1□□H03□ | X8L (Murata) | 50Vdc         | 0.33μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL81H334K1□□H03□ | X8L (Murata) | 50Vdc         | 0.33μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL81H474K2□□H03□ | X8L (Murata) | 50Vdc         | 0.47μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL81H474K2□□H03□ | X8L (Murata) | 50Vdc         | 0.47μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81H684K2□□H03□ | X8L (Murata) | 50Vdc         | 0.68μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL81H684K2□□H03□ | X8L (Murata) | 50Vdc         | 0.68μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81H105K2□□H03□ | X8L (Murata) | 50Vdc         | 1.0μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL81H105K2□□H03□ | X8L (Murata) | 50Vdc         | 1.0μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81H155K2□□H03□ | X8L (Murata) | 50Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL81H155K2□□H03□ | X8L (Murata) | 50Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81H225K2□□H03□ | X8L (Murata) | 50Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |

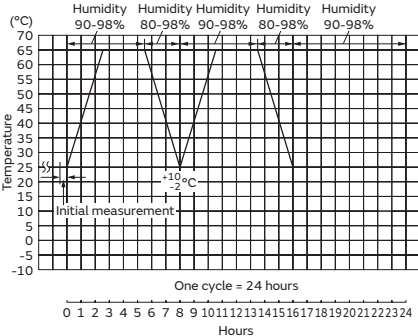
Continued on the following page. ➡

Continued from the preceding page. ↘

| Part Number        | Temp. Char.  | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|--------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RHEL81H225K2□□H03□ | X8L (Murata) | 50Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL81H335K3□□H03□ | X8L (Murata) | 50Vdc         | 3.3μF±10%   | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RHEL81H335K3□□H03□ | X8L (Murata) | 50Vdc         | 3.3μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RHEL81H475K3□□H03□ | X8L (Murata) | 50Vdc         | 4.7μF±10%   | 5.5×5.0             | 4.0              | 2.5               | A2                   | DB                     |
| RHEL81H475K3□□H03□ | X8L (Murata) | 50Vdc         | 4.7μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RHEL81H106MW□□H03□ | X8L (Murata) | 50Vdc         | 10μF±20%    | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RHEL82A221K0□□H03□ | X8L (Murata) | 100Vdc        | 220pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A221K0□□H03□ | X8L (Murata) | 100Vdc        | 220pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A331K0□□H03□ | X8L (Murata) | 100Vdc        | 330pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A331K0□□H03□ | X8L (Murata) | 100Vdc        | 330pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A471K0□□H03□ | X8L (Murata) | 100Vdc        | 470pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A471K0□□H03□ | X8L (Murata) | 100Vdc        | 470pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A681K0□□H03□ | X8L (Murata) | 100Vdc        | 680pF±10%   | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A681K0□□H03□ | X8L (Murata) | 100Vdc        | 680pF±10%   | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A102K0□□H03□ | X8L (Murata) | 100Vdc        | 1000pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A102K0□□H03□ | X8L (Murata) | 100Vdc        | 1000pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A152K0□□H03□ | X8L (Murata) | 100Vdc        | 1500pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A152K0□□H03□ | X8L (Murata) | 100Vdc        | 1500pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A222K0□□H03□ | X8L (Murata) | 100Vdc        | 2200pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A222K0□□H03□ | X8L (Murata) | 100Vdc        | 2200pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A332K0□□H03□ | X8L (Murata) | 100Vdc        | 3300pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A332K0□□H03□ | X8L (Murata) | 100Vdc        | 3300pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A472K0□□H03□ | X8L (Murata) | 100Vdc        | 4700pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A472K0□□H03□ | X8L (Murata) | 100Vdc        | 4700pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A682K0□□H03□ | X8L (Murata) | 100Vdc        | 6800pF±10%  | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A682K0□□H03□ | X8L (Murata) | 100Vdc        | 6800pF±10%  | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A103K0□□H03□ | X8L (Murata) | 100Vdc        | 10000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A103K0□□H03□ | X8L (Murata) | 100Vdc        | 10000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A153K0□□H03□ | X8L (Murata) | 100Vdc        | 15000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A153K0□□H03□ | X8L (Murata) | 100Vdc        | 15000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A223K0□□H03□ | X8L (Murata) | 100Vdc        | 22000pF±10% | 3.6×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A223K0□□H03□ | X8L (Murata) | 100Vdc        | 22000pF±10% | 3.6×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A333K1□□H03□ | X8L (Murata) | 100Vdc        | 33000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A333K1□□H03□ | X8L (Murata) | 100Vdc        | 33000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A473K1□□H03□ | X8L (Murata) | 100Vdc        | 47000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A473K1□□H03□ | X8L (Murata) | 100Vdc        | 47000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A683K1□□H03□ | X8L (Murata) | 100Vdc        | 68000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A683K1□□H03□ | X8L (Murata) | 100Vdc        | 68000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A104K1□□H03□ | X8L (Murata) | 100Vdc        | 0.10μF±10%  | 4.0×3.5             | 2.5              | 2.5               | A2                   | DB                     |
| RHEL82A104K1□□H03□ | X8L (Murata) | 100Vdc        | 0.10μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RHEL82A154K2□□H03□ | X8L (Murata) | 100Vdc        | 0.15μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL82A154K2□□H03□ | X8L (Murata) | 100Vdc        | 0.15μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RHEL82A224K2□□H03□ | X8L (Murata) | 100Vdc        | 0.22μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DB                     |
| RHEL82A224K2□□H03□ | X8L (Murata) | 100Vdc        | 0.22μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## Specifications and Test Methods

| No.        | AEC-Q200 Test Item                                               | Specification                                                                                       |                                              | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|---|---|---|------------|----------|------------|----------|------------|------------|------|---|------|---|
|            |                                                                  | Temperature Compensating Type<br>(Char. X8G)                                                        | High Dielectric Constant Type<br>(Char. X8L) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
| 1          | Pre-and Post-Stress Electrical Test                              | -                                                                                                   |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
| 2          | High Temperature Exposure (Storage)                              | The measured and observed characteristics should satisfy the specifications in the following table. |                                              | Sit the capacitor for 1000±12h at 150±3°C. Let sit for 24±2h at room condition*, then measure.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*. (for Char. X8L)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Appearance                                                       | No defects or abnormalities                                                                         |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Capacitance Change                                               | Within ±3% or ±0.3pF (Whichever is larger)                                                          | Within ±12.5%                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Q/D.F.                                                           | Q ≥ 350                                                                                             | 0.04 max.                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
| 3          | Temperature Cycling                                              | The measured and observed characteristics should satisfy the specifications in the following table. |                                              | Perform the 1000 cycles according to the four heat treatments listed in the following table. Let sit for 24±2h at room condition*, then measure.<br><table><tr><th>Step</th><th>1</th><th>2</th><th>3</th><th>4</th></tr><tr><td>Temp. (°C)</td><td>-55+0/-3</td><td>Room Temp.</td><td>150+3/-0</td><td>Room Temp.</td></tr><tr><td>Time (min)</td><td>15±3</td><td>1</td><td>15±3</td><td>1</td></tr></table> •Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*. (for Char. X8L)                                                                                                                                                                                                                       | Step     | 1          | 2 | 3 | 4 | Temp. (°C) | -55+0/-3 | Room Temp. | 150+3/-0 | Room Temp. | Time (min) | 15±3 | 1 | 15±3 | 1 |
|            | Step                                                             | 1                                                                                                   | 2                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3        | 4          |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Temp. (°C)                                                       | -55+0/-3                                                                                            | Room Temp.                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 150+3/-0 | Room Temp. |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Time (min)                                                       | 15±3                                                                                                | 1                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 15±3     | 1          |   |   |   |            |          |            |          |            |            |      |   |      |   |
| Appearance | No defects or abnormalities except color change of outer coating |                                                                                                     |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
| 4          | Moisture Resistance                                              | The measured and observed characteristics should satisfy the specifications in the following table. |                                              | Apply the 24h heat (25 to 65°C) and humidity (80 to 98%) treatment shown below, 10 consecutive times.<br>Let sit for 24±2h at room condition*, then measure.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*. (for Char. X8L)<br> <p>The graph shows a temperature profile over 24 hours. The temperature starts at 25°C, rises to 65°C, stays there for 1 hour, then drops to -10°C, stays there for 1 hour, and then rises back to 25°C. This cycle repeats 10 times. Humidity is maintained at 90-98% during the 65°C phase and 80-98% during the -10°C phase. The initial measurement is taken at 25°C.</p> |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Appearance                                                       | No defects or abnormalities                                                                         |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Capacitance Change                                               | Within ±5% or ±0.5pF (Whichever is larger)                                                          | Within ±12.5%                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Q/D.F.                                                           | Q ≥ 200                                                                                             | 0.05 max.                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
| 5          | Biased Humidity                                                  | The measured and observed characteristics should satisfy the specifications in the following table. |                                              | Apply the rated voltage and DC1.3+0.2/-0V (add 100kΩ resistor) at 85±3°C and 80 to 85% humidity for 1000±12h.<br>Remove and let sit for 24±2h at room condition*, then measure.<br>The charge/discharge current is less than 50mA.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*. (for Char. X8L)                                                                                                                                                                                                                                                                                                                                                                                                 |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Appearance                                                       | No defects or abnormalities                                                                         |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Capacitance Change                                               | Within ±5% or ±0.5pF (Whichever is larger)                                                          | Within ±12.5%                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Q/D.F.                                                           | Q ≥ 200                                                                                             | 0.05 max.                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
| 6          | Operational Life                                                 | The measured and observed characteristics should satisfy the specifications in the following table. |                                              | Apply 150% of the rated voltage for 1000±12h at 150±3°C.<br>Let sit for 24±2h at room condition*, then measure.<br>The charge/discharge current is less than 50mA.<br>•Pretreatment<br>Apply test voltage for 60±5 min at test temperature.<br>Remove and let sit for 24±2h at room condition*. (for Char. X8L)                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Appearance                                                       | No defects or abnormalities except color change of outer coating                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Capacitance Change                                               | Within ±3% or ±0.3pF (Whichever is larger)                                                          | Within ±12.5%                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Q/D.F.                                                           | Q ≥ 350                                                                                             | 0.04 max.                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
| 7          | External Visual                                                  | No defects or abnormalities                                                                         |                                              | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
|            | Physical Dimension                                               | Within the specified dimensions                                                                     |                                              | Using calipers and micrometers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |
| 9          | Marking                                                          | To be easily legible                                                                                |                                              | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |            |   |   |   |            |          |            |          |            |            |      |   |      |   |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ➤

## Specifications and Test Methods

Continued from the preceding page. ↘

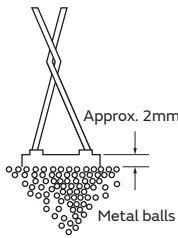
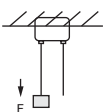
| No.                | AEC-Q200 Test Item                                      |                                                                                                     | Specification                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                      |   |   |            |          |          |            |      |      |
|--------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|------------|----------|----------|------------|------|------|
|                    |                                                         |                                                                                                     | Temperature Compensating Type<br>(Char. X8G)           | High Dielectric Constant Type<br>(Char. X8L)                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| 10                 | Resistance to Solvents                                  | Appearance                                                                                          | No defects or abnormalities                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Per MIL-STD-202 Method 215<br>Solvent 1: 1 part (by volume) of isopropyl alcohol<br>3 parts (by volume) of mineral spirits<br>Solvent 2: Terpene defluxer<br>Solvent 3: 42 parts (by volume) of water<br>1 part (by volume) of propylene glycol monomethyl ether<br>1 part (by volume) of monoethanolamine                                                                                                |   |   |            |          |          |            |      |      |
|                    |                                                         | Capacitance                                                                                         | Within the specified tolerance                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Q/D.F.                                                                                              | Q ≥ 1000                                               | 0.025 max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | I.R.                                                                                                | More than 10000MΩ or 500MΩ • μF (Whichever is smaller) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| 11                 | Mechanical Shock                                        | Appearance                                                                                          | No defects or abnormalities                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks). The specified test pulse should be Half-sine and should have a duration: 0.5ms, peak value: 1500G and velocity change: 4.7m/s.                                                                                                                                                     |   |   |            |          |          |            |      |      |
|                    |                                                         | Capacitance                                                                                         | Within the specified tolerance                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Q/D.F.                                                                                              | Q ≥ 1000                                               | 0.025 max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| 12                 | Vibration                                               | Appearance                                                                                          | No defects or abnormalities                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 2000Hz. The frequency range, from 10 to 2000Hz and return to 10Hz, should be traversed in approximately 20min. This motion should be applied for 12 items in each 3 mutually perpendicular directions (total of 36 times). |   |   |            |          |          |            |      |      |
|                    |                                                         | Capacitance                                                                                         | Within the specified tolerance                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Q/D.F.                                                                                              | Q ≥ 1000                                               | 0.025 max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| 13<br>,<br>1       | Resistance to Soldering Heat<br>(Non-Preheat)           | The measured and observed characteristics should satisfy the specifications in the following table. |                                                        | The lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 10±1s.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement. (For Char. X8L)<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Appearance                                                                                          | No defects or abnormalities                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Capacitance Change                                                                                  | Within ±2.5% or ±0.25pF (Whichever is larger)          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Within ±7.5%                                                                                                                                                                                                                                                                                                                                                                                              |   |   |            |          |          |            |      |      |
|                    |                                                         | Dielectric Strength (Between Terminals)                                                             | No defects                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| 13<br>,<br>2       | Resistance to Soldering Heat<br>(On-Preheat)            | The measured and observed characteristics should satisfy the specifications in the following table. |                                                        | First the capacitor should be stored at 120+0/-5°C for 60+0/-5s. Then, the lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement. (For Char. X8L)<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                                                              |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Appearance                                                                                          | No defects or abnormalities                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Capacitance Change                                                                                  | Within ±2.5% or ±0.25pF (Whichever is larger)          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Within ±7.5%                                                                                                                                                                                                                                                                                                                                                                                              |   |   |            |          |          |            |      |      |
|                    |                                                         | Dielectric Strength (Between Terminals)                                                             | No defects                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| 13<br>,<br>3       | Resistance to Soldering Heat<br>(Soldering Iron Method) | The measured and observed characteristics should satisfy the specifications in the following table. |                                                        | Test condition<br>Temperature of iron-tip: 350±10°C<br>Soldering time: 3.5±0.5s.<br>Soldering position<br>Straight Lead: 1.5 to 2.0mm from the root of terminal.<br>Crimp Lead: 1.5 to 2.0mm from the end of lead bend.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement. (For Char. X8L)<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                                     |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Appearance                                                                                          | No defects or abnormalities                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Capacitance Change                                                                                  | Within ±2.5% or ±0.25pF (Whichever is larger)          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Within ±7.5%                                                                                                                                                                                                                                                                                                                                                                                              |   |   |            |          |          |            |      |      |
|                    |                                                         | Dielectric Strength (Between Terminals)                                                             | No defects                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| 14                 | Thermal Shock                                           | The measured and observed characteristics should satisfy the specifications in the following table. |                                                        | Perform the 300 cycles according to the two heat treatments listed in the following table (Maximum transfer time is 20s). Let sit for 24±2h at room condition*, then measure. <table><tr><th>Step</th><th>1</th><th>2</th></tr><tr><td>Temp. (°C)</td><td>-55+0/-3</td><td>150+3/-0</td></tr><tr><td>Time (min)</td><td>15±3</td><td>15±3</td></tr></table><br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 60±5min and then let sit for 24±2h at room condition*. (for Char. X8L) | Step                                                                                                                                                                                                                                                                                                                                                                                                      | 1 | 2 | Temp. (°C) | -55+0/-3 | 150+3/-0 | Time (min) | 15±3 | 15±3 |
|                    |                                                         | Step                                                                                                | 1                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2                                                                                                                                                                                                                                                                                                                                                                                                         |   |   |            |          |          |            |      |      |
|                    |                                                         | Temp. (°C)                                                                                          | -55+0/-3                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 150+3/-0                                                                                                                                                                                                                                                                                                                                                                                                  |   |   |            |          |          |            |      |      |
|                    |                                                         | Time (min)                                                                                          | 15±3                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 15±3                                                                                                                                                                                                                                                                                                                                                                                                      |   |   |            |          |          |            |      |      |
|                    |                                                         | Appearance                                                                                          | No defects or abnormalities                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| Capacitance Change | Within ±5% or ±0.5pF (Whichever is larger)              | Within ±12.5%                                                                                       |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| Q/D.F.             | Q ≥ 350                                                 | 0.05 max.                                                                                           |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| I.R.               | 1000MΩ or 50MΩ • μF min. (Whichever is smaller)         |                                                                                                     |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
| 15                 | ESD                                                     | Appearance                                                                                          | No defects or abnormalities                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Per AEC-Q200-002                                                                                                                                                                                                                                                                                                                                                                                          |   |   |            |          |          |            |      |      |
|                    |                                                         | Capacitance                                                                                         | Within the specified tolerance                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | Q/D.F.                                                                                              | Q ≥ 1000                                               | 0.025 max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |
|                    |                                                         | I.R.                                                                                                | More than 10000MΩ or 500MΩ • μF (Whichever is smaller) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |            |          |          |            |      |      |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

## Specifications and Test Methods

Continued from the preceding page. ↘

| No.                          | AEC-Q200 Test Item                      | Specification                                                                                                                                                                                                                                      |                                              | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------|-----------|---------|-----|------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|-------------------|------|----------|----------|---------------------|----------|----------|---------------------|---|------|
|                              |                                         | Temperature Compensating Type<br>(Char. X8G)                                                                                                                                                                                                       | High Dielectric Constant Type<br>(Char. X8L) |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 16                           | Solderability                           | Lead wire should be soldered with uniform coating on the axial direction over 95% of the circumferential direction.                                                                                                                                |                                              | <p>The terminal of a capacitor is dipped into a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25%rosin in weight propotion) and then into molten solder (JIS-Z-3282) for 2±0.5s. In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body.</p> <p>Temp. of solder:<br/>245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu)<br/>235±5°C H60A or H63A Eutectic Solder</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 17                           | Electrical Charac-<br>terization        | Appearance                                                                                                                                                                                                                                         | No defects or abnormalities                  |                                                                                                                                                                                                                                                                                                                                                                                                     | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                  |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              |                                         | Capacitance                                                                                                                                                                                                                                        | Within the specified tolerance               |                                                                                                                                                                                                                                                                                                                                                                                                     | The capacitance, Q/D.F. should be measured at 25°C at the frequency and voltage shown in the table.                                                                                                                                                                                                                                                                                                                                                |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              |                                         | Q/D.F.                                                                                                                                                                                                                                             | Q ≥ 1000                                     | 0.025 max.                                                                                                                                                                                                                                                                                                                                                                                          | <table><tr><th>Char.</th><th>Nominal Cap.</th><th>Frequency</th><th>Voltage</th></tr><tr><td rowspan="2">X8G</td><td>C &lt; 1000pF</td><td>1±0.1MHz</td><td>AC0.5 to 5V (r.m.s.)</td></tr><tr><td>C ≥ 1000pF</td><td>1±0.1kHz</td><td>AC1±0.2V (r.m.s.)</td></tr><tr><td rowspan="2">X8L</td><td>C ≤ 10μF</td><td>1±0.1kHz</td><td>AC1.0±0.2V (r.m.s.)</td></tr><tr><td>C &gt; 10μF</td><td>120±24Hz</td><td>AC0.5±0.1V (r.m.s.)</td></tr></table> | Char.                      | Nominal Cap.                   | Frequency | Voltage | X8G | C < 1000pF | 1±0.1MHz                                                                                                  | AC0.5 to 5V (r.m.s.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | C ≥ 1000pF | 1±0.1kHz         | AC1±0.2V (r.m.s.) | X8L  | C ≤ 10μF | 1±0.1kHz | AC1.0±0.2V (r.m.s.) | C > 10μF | 120±24Hz | AC0.5±0.1V (r.m.s.) |   |      |
|                              |                                         | Char.                                                                                                                                                                                                                                              | Nominal Cap.                                 | Frequency                                                                                                                                                                                                                                                                                                                                                                                           | Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                            |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              |                                         | X8G                                                                                                                                                                                                                                                | C < 1000pF                                   | 1±0.1MHz                                                                                                                                                                                                                                                                                                                                                                                            | AC0.5 to 5V (r.m.s.)                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              |                                         |                                                                                                                                                                                                                                                    | C ≥ 1000pF                                   | 1±0.1kHz                                                                                                                                                                                                                                                                                                                                                                                            | AC1±0.2V (r.m.s.)                                                                                                                                                                                                                                                                                                                                                                                                                                  |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| X8L                          | C ≤ 10μF                                | 1±0.1kHz                                                                                                                                                                                                                                           | AC1.0±0.2V (r.m.s.)                          |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              | C > 10μF                                | 120±24Hz                                                                                                                                                                                                                                           | AC0.5±0.1V (r.m.s.)                          |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| Insulation Resistance (I.R.) | Room Temperature                        | 10000MΩ or 500MΩ • μF min.<br>(Whichever is smaller)                                                                                                                                                                                               |                                              | The insulation resistance should be measured at 25±3°C with a DC voltage not exceeding the rated voltage at normal temperature and humidity and within 2min of charging.<br>(Charge/Discharge current ≤ 50mA.)                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              | High Temperature                        | 100MΩ or 5MΩ • μF min.<br>(Whichever is smaller)                                                                                                                                                                                                   |                                              | The insulation resistance should be measured at 150±3°C with a DC voltage not exceeding the rated voltage at normal temperature and humidity and within 2min of charging.<br>(Charge/Discharge current ≤ 50mA.)                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| Dielectric Strength          | Between Terminals                       | No defects or abnormalities                                                                                                                                                                                                                        |                                              | The capacitor should not be damaged when DC voltage of 300% of the rated voltage (for Char. X8G) or DC voltage of 250% of the rated voltage (for Char. X8L) is applied between the terminations for 1 to 5s.<br>(Charge/Discharge current ≤ 50mA.)                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              | Body Insulation                         | No defects or abnormalities                                                                                                                                                                                                                        |                                              | <p>The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuit is kept approximately 2mm from the balls, and 250% of the rated DC voltage is impressed for 1 to 5s between capacitor terminals and metal balls.<br/>(Charge/Discharge current ≤ 50mA.)</p>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 18                           | Terminal Strength                       | Tensile Strength                                                                                                                                                                                                                                   | Termination not to be broken or loosened     |                                                                                                                                                                                                                                                                                                                                                                                                     | <p>As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1s.</p>                                                                                                                                                                |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              |                                         | Bending Strength                                                                                                                                                                                                                                   | Termination not to be broken or loosened     |                                                                                                                                                                                                                                                                                                                                                                                                     | Each lead wire should be subjected to a force of 2.5N and then be bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3s.                                                                                                                                                                                                |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 19                           | Capacitance Temperature Characteristics | <table><tr><th>Char.</th><th>Temperature Coefficient</th></tr><tr><td rowspan="4">X8G</td><td>25 to 150°C:<br/>0±30ppm/°C</td></tr><tr><td>-55 to 25°C:<br/>0+30/-72ppm/°C</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> | Char.                                        | Temperature Coefficient                                                                                                                                                                                                                                                                                                                                                                             | X8G                                                                                                                                                                                                                                                                                                                                                                                                                                                | 25 to 150°C:<br>0±30ppm/°C | -55 to 25°C:<br>0+30/-72ppm/°C |           |         |     |            | <p>Within ±15%<br/>(Temp. Range: -55 to +125°C)<br/>Within +15/-40%<br/>(Temp. Range: +125 to +150°C)</p> | <p>The capacitance change should be measured after 5min at each specified temperature step.</p> <table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>150±3</td></tr><tr><td>5</td><td>25±2</td></tr></table> <p>The temperature coefficient or the ranges of capacitance change is determined using the capacitance measured in step 3 as a reference.</p> <p>•Pretreatment<br/>Perform the heat treatment at 150+0/-10°C for 60±5 min and then let sit for 24±2h at room condition*.<br/>Perform the initial measurement. (for Char. X8L)</p> | Step       | Temperature (°C) | 1                 | 25±2 | 2        | -55±3    | 3                   | 25±2     | 4        | 150±3               | 5 | 25±2 |
| Char.                        | Temperature Coefficient                 |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| X8G                          | 25 to 150°C:<br>0±30ppm/°C              |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              | -55 to 25°C:<br>0+30/-72ppm/°C          |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              |                                         |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
|                              |                                         |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| Step                         | Temperature (°C)                        |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 1                            | 25±2                                    |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 2                            | -55±3                                   |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 3                            | 25±2                                    |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 4                            | 150±3                                   |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |
| 5                            | 25±2                                    |                                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                |           |         |     |            |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                  |                   |      |          |          |                     |          |          |                     |   |      |

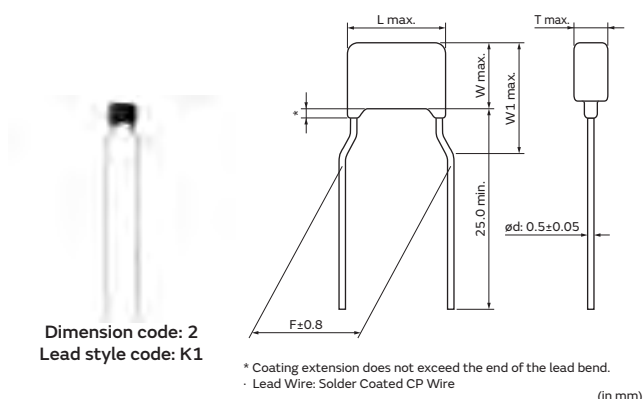
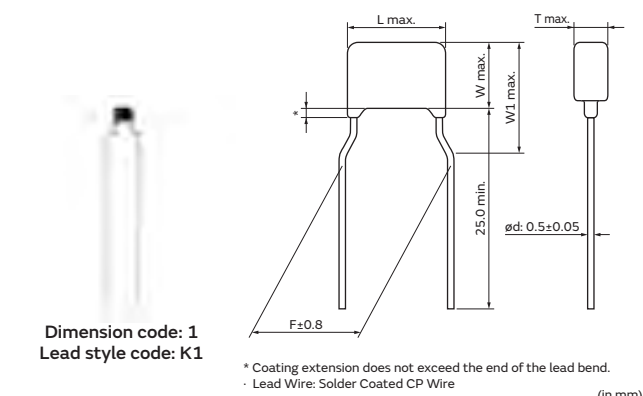
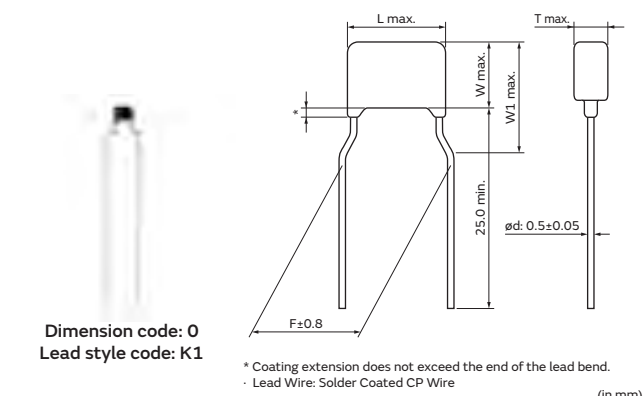
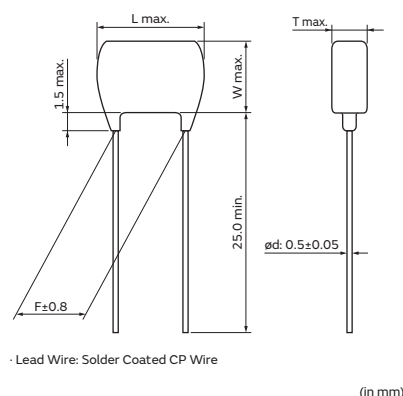
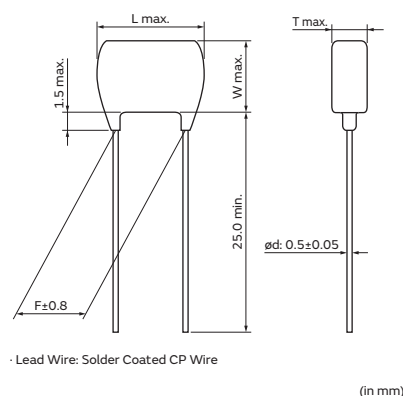
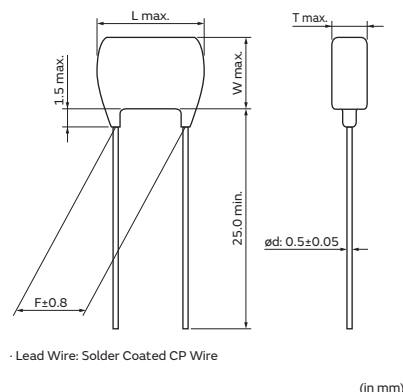
\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

# 175°C/200°C Operation Leaded MLCC for Automotive

## RHS Series (DC100V-DC500V)

### Features

1. Small size and large capacitance
2. Low ESR and ESL suitable for high frequency
3. Applied maximum temperature up to 175°C or 200°C  
Note: Maximum accumulative time is within 2000 hours.
4. Meet AEC-Q200, ISO7637-2 (surge test) requirement
5. Meet LF (Lead Free) and HF (Halogen Free)
6. Flow soldering and welding are available.  
(Re-flow soldering is not available.)
7. If copper wire is necessary at welding process, copper wire is available based on request.



### Dimensions

| Dimensions and Lead Style Code | Dimensions (mm) |     |     |                                          |     |     |
|--------------------------------|-----------------|-----|-----|------------------------------------------|-----|-----|
|                                | L               | W   | W1  | T                                        | F   | d   |
| 0A2/0DG                        | 3.8             | 3.5 | -   | See the individual product specification | 2.5 | 0.5 |
| 0K1/0M2                        | 3.8             | 3.5 | 6.0 |                                          | 5.0 | 0.5 |
| 1A2/1DG                        | 4.0             | 3.5 | -   |                                          | 2.5 | 0.5 |
| 1K1/1M2                        | 4.0             | 3.5 | 5.0 |                                          | 5.0 | 0.5 |
| 2A2/2DG                        | 5.5             | 4.0 | -   |                                          | 2.5 | 0.5 |
| 2K1/2M1                        | 5.5             | 4.0 | 6.0 |                                          | 5.0 | 0.5 |

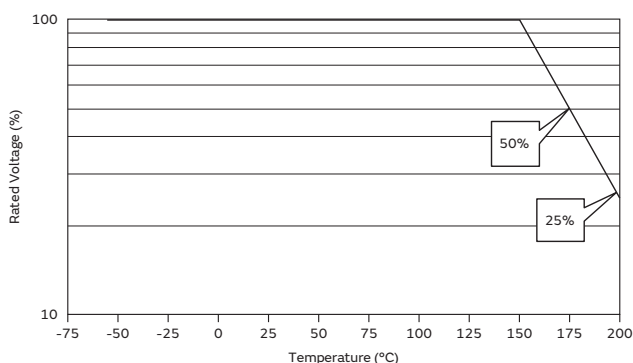
## Rated Voltage

When the product temperature exceeds 150°C, please use this product within the voltage and temperature derated conditions in the figure below.

Maximum operating temperature

200°C: Temp. Char. CCG and UNJ

175°C: Temp. Char. XAL and XAN



## Marking

| Dimension Code                | Rated Voltage | DC100V                                                                                                        |           |              | DC200V       | DC500V       |
|-------------------------------|---------------|---------------------------------------------------------------------------------------------------------------|-----------|--------------|--------------|--------------|
|                               | Temp. Char.   | CCG                                                                                                           | XAL       | XAN          | UNJ          |              |
| 0                             |               | 4<br>101J                                                                                                     | 6<br>103K | 9<br>103K    | —            | —            |
| 1                             |               |                                                                                                               | —         |              | 2<br>101J    | —            |
| 2                             |               | —                                                                                                             | —         | M 224<br>K19 | M 103<br>J62 | M 101<br>J92 |
| Temperature Characteristics   |               | Marked with code (CCG Char.: 4, UNJ Char.: 2, XAL Char.: 6, XAN Char.: 9)                                     |           |              |              |              |
| Nominal Capacitance           |               | Marked with 3 figures                                                                                         |           |              |              |              |
| Capacitance Tolerance         |               | Marked with code                                                                                              |           |              |              |              |
| Rated Voltage                 |               | Marked with code (DC100V: 1, DC200V: 6, DC500V: 9)<br>Apart is omitted (Please refer to the marking example.) |           |              |              |              |
| Manufacturer's Identification |               | Marked with M<br>A part is omitted (Please refer to the marking example.)                                     |           |              |              |              |

## Temperature Compensating Type, CCG/UNJ Characteristics

| Part Number        | Temp. Char.  | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|--------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RHS7G2A101J0□□H01□ | CCG (Murata) | 100Vdc        | 100pF±5%    | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHS7G2A101J0□□H01□ | CCG (Murata) | 100Vdc        | 100pF±5%    | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHS7G2A121J0□□H01□ | CCG (Murata) | 100Vdc        | 120pF±5%    | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHS7G2A121J0□□H01□ | CCG (Murata) | 100Vdc        | 120pF±5%    | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHS7G2A151J0□□H01□ | CCG (Murata) | 100Vdc        | 150pF±5%    | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHS7G2A151J0□□H01□ | CCG (Murata) | 100Vdc        | 150pF±5%    | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHS7G2A181J0□□H01□ | CCG (Murata) | 100Vdc        | 180pF±5%    | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHS7G2A181J0□□H01□ | CCG (Murata) | 100Vdc        | 180pF±5%    | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHS7G2A221J0□□H01□ | CCG (Murata) | 100Vdc        | 220pF±5%    | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHS7G2A221J0□□H01□ | CCG (Murata) | 100Vdc        | 220pF±5%    | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHS7G2A271J0□□H01□ | CCG (Murata) | 100Vdc        | 270pF±5%    | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHS7G2A271J0□□H01□ | CCG (Murata) | 100Vdc        | 270pF±5%    | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |

Continued on the following page. ↗

Continued from the preceding page. ↘

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RHS7G2A331J0□□H01□ | CCG (Murata)   | 100Vdc           | 330pF±5%    | 3.8×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A331J0□□H01□ | CCG (Murata)   | 100Vdc           | 330pF±5%    | 3.8×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A391J0□□H01□ | CCG (Murata)   | 100Vdc           | 390pF±5%    | 3.8×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A391J0□□H01□ | CCG (Murata)   | 100Vdc           | 390pF±5%    | 3.8×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A471J0□□H01□ | CCG (Murata)   | 100Vdc           | 470pF±5%    | 3.8×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A471J0□□H01□ | CCG (Murata)   | 100Vdc           | 470pF±5%    | 3.8×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A561J0□□H01□ | CCG (Murata)   | 100Vdc           | 560pF±5%    | 3.8×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A561J0□□H01□ | CCG (Murata)   | 100Vdc           | 560pF±5%    | 3.8×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A681J0□□H01□ | CCG (Murata)   | 100Vdc           | 680pF±5%    | 3.8×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A681J0□□H01□ | CCG (Murata)   | 100Vdc           | 680pF±5%    | 3.8×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A821J0□□H01□ | CCG (Murata)   | 100Vdc           | 820pF±5%    | 3.8×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A821J0□□H01□ | CCG (Murata)   | 100Vdc           | 820pF±5%    | 3.8×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A102J0□□H01□ | CCG (Murata)   | 100Vdc           | 1000pF±5%   | 3.8×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A102J0□□H01□ | CCG (Murata)   | 100Vdc           | 1000pF±5%   | 3.8×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A152J0□□H01□ | CCG (Murata)   | 100Vdc           | 1500pF±5%   | 3.8×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A152J0□□H01□ | CCG (Murata)   | 100Vdc           | 1500pF±5%   | 3.8×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A222J1□□H01□ | CCG (Murata)   | 100Vdc           | 2200pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A222J1□□H01□ | CCG (Murata)   | 100Vdc           | 2200pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A272J1□□H01□ | CCG (Murata)   | 100Vdc           | 2700pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A272J1□□H01□ | CCG (Murata)   | 100Vdc           | 2700pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7G2A332J1□□H01□ | CCG (Murata)   | 100Vdc           | 3300pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7G2A332J1□□H01□ | CCG (Murata)   | 100Vdc           | 3300pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D101J1□□H01□ | UNJ (Murata)   | 200Vdc           | 100pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D101J1□□H01□ | UNJ (Murata)   | 200Vdc           | 100pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D151J1□□H01□ | UNJ (Murata)   | 200Vdc           | 150pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D151J1□□H01□ | UNJ (Murata)   | 200Vdc           | 150pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D221J1□□H01□ | UNJ (Murata)   | 200Vdc           | 220pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D221J1□□H01□ | UNJ (Murata)   | 200Vdc           | 220pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D331J1□□H01□ | UNJ (Murata)   | 200Vdc           | 330pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D331J1□□H01□ | UNJ (Murata)   | 200Vdc           | 330pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D471J1□□H01□ | UNJ (Murata)   | 200Vdc           | 470pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D471J1□□H01□ | UNJ (Murata)   | 200Vdc           | 470pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D681J1□□H01□ | UNJ (Murata)   | 200Vdc           | 680pF±5%    | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D681J1□□H01□ | UNJ (Murata)   | 200Vdc           | 680pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D102J1□□H01□ | UNJ (Murata)   | 200Vdc           | 1000pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D102J1□□H01□ | UNJ (Murata)   | 200Vdc           | 1000pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D152J1□□H01□ | UNJ (Murata)   | 200Vdc           | 1500pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D152J1□□H01□ | UNJ (Murata)   | 200Vdc           | 1500pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D222J1□□H01□ | UNJ (Murata)   | 200Vdc           | 2200pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D222J1□□H01□ | UNJ (Murata)   | 200Vdc           | 2200pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D332J1□□H01□ | UNJ (Murata)   | 200Vdc           | 3300pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D332J1□□H01□ | UNJ (Murata)   | 200Vdc           | 3300pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D472J1□□H01□ | UNJ (Murata)   | 200Vdc           | 4700pF±5%   | 4.0×3.5                   | 2.5                    | 2.5                     | A2                         | DG                           |
| RHS7J2D472J1□□H01□ | UNJ (Murata)   | 200Vdc           | 4700pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M2                           |
| RHS7J2D682J2□□H01□ | UNJ (Murata)   | 200Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DG                           |
| RHS7J2D682J2□□H01□ | UNJ (Murata)   | 200Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2D103J2□□H01□ | UNJ (Murata)   | 200Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 2.5                     | A2                         | DG                           |
| RHS7J2D103J2□□H01□ | UNJ (Murata)   | 200Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H101J2□□H01□ | UNJ (Murata)   | 500Vdc           | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H151J2□□H01□ | UNJ (Murata)   | 500Vdc           | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H221J2□□H01□ | UNJ (Murata)   | 500Vdc           | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H331J2□□H01□ | UNJ (Murata)   | 500Vdc           | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H471J2□□H01□ | UNJ (Murata)   | 500Vdc           | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H681J2□□H01□ | UNJ (Murata)   | 500Vdc           | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H102J2□□H01□ | UNJ (Murata)   | 500Vdc           | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H152J2□□H01□ | UNJ (Murata)   | 500Vdc           | 1500pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |
| RHS7J2H222J2□□H01□ | UNJ (Murata)   | 500Vdc           | 2200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M2                           |

Continued on the following page. ↗

Continued from the preceding page. ↘

| Part Number        | Temp. Char.  | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|--------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RHS7J2H332J2□□H01□ | UNJ (Murata) | 500Vdc        | 3300pF±5%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M2                     |
| RHS7J2H472J2□□H01□ | UNJ (Murata) | 500Vdc        | 4700pF±5%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M2                     |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## High Dielectric Constant Type, XAL/XAN Characteristics

| Part Number        | Temp. Char.  | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|--------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RHSL12A472K0□□H01□ | XAL (Murata) | 100Vdc        | 4700pF±10%  | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A472K0□□H01□ | XAL (Murata) | 100Vdc        | 4700pF±10%  | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSL12A682K0□□H01□ | XAL (Murata) | 100Vdc        | 6800pF±10%  | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A682K0□□H01□ | XAL (Murata) | 100Vdc        | 6800pF±10%  | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSL12A103K0□□H01□ | XAL (Murata) | 100Vdc        | 10000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A103K0□□H01□ | XAL (Murata) | 100Vdc        | 10000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSL12A153K0□□H01□ | XAL (Murata) | 100Vdc        | 15000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A153K0□□H01□ | XAL (Murata) | 100Vdc        | 15000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSL12A223K0□□H01□ | XAL (Murata) | 100Vdc        | 22000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A223K0□□H01□ | XAL (Murata) | 100Vdc        | 22000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSL12A333K0□□H01□ | XAL (Murata) | 100Vdc        | 33000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A333K0□□H01□ | XAL (Murata) | 100Vdc        | 33000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSL12A473K0□□H01□ | XAL (Murata) | 100Vdc        | 47000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A473K0□□H01□ | XAL (Murata) | 100Vdc        | 47000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSL12A683K0□□H01□ | XAL (Murata) | 100Vdc        | 68000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A683K0□□H01□ | XAL (Murata) | 100Vdc        | 68000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSL12A104K0□□H01□ | XAL (Murata) | 100Vdc        | 0.1μF±10%   | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSL12A104K0□□H01□ | XAL (Murata) | 100Vdc        | 0.1μF±10%   | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A472K0□□H01□ | XAN (Murata) | 100Vdc        | 4700pF±10%  | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A472K0□□H01□ | XAN (Murata) | 100Vdc        | 4700pF±10%  | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A682K0□□H01□ | XAN (Murata) | 100Vdc        | 6800pF±10%  | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A682K0□□H01□ | XAN (Murata) | 100Vdc        | 6800pF±10%  | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A103K0□□H01□ | XAN (Murata) | 100Vdc        | 10000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A103K0□□H01□ | XAN (Murata) | 100Vdc        | 10000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A153K0□□H01□ | XAN (Murata) | 100Vdc        | 15000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A153K0□□H01□ | XAN (Murata) | 100Vdc        | 15000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A223K0□□H01□ | XAN (Murata) | 100Vdc        | 22000pF±10% | 3.8×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A223K0□□H01□ | XAN (Murata) | 100Vdc        | 22000pF±10% | 3.8×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A333K1□□H01□ | XAN (Murata) | 100Vdc        | 33000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A333K1□□H01□ | XAN (Murata) | 100Vdc        | 33000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A473K1□□H01□ | XAN (Murata) | 100Vdc        | 47000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A473K1□□H01□ | XAN (Murata) | 100Vdc        | 47000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A683K1□□H01□ | XAN (Murata) | 100Vdc        | 68000pF±10% | 4.0×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A683K1□□H01□ | XAN (Murata) | 100Vdc        | 68000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A104K1□□H01□ | XAN (Murata) | 100Vdc        | 0.1μF±10%   | 4.0×3.5             | 2.5              | 2.5               | A2                   | DG                     |
| RHSN12A104K1□□H01□ | XAN (Murata) | 100Vdc        | 0.1μF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M2                     |
| RHSN12A154K2□□H01□ | XAN (Murata) | 100Vdc        | 0.15μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DG                     |
| RHSN12A154K2□□H01□ | XAN (Murata) | 100Vdc        | 0.15μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M2                     |
| RHSN12A224K2□□H01□ | XAN (Murata) | 100Vdc        | 0.22μF±10%  | 5.5×4.0             | 3.15             | 2.5               | A2                   | DG                     |
| RHSN12A224K2□□H01□ | XAN (Murata) | 100Vdc        | 0.22μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M2                     |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## Temperature Compensating Type Specifications and Test Methods

| No.                | AEC-Q200 Test Item                         |                    | Specifications                                                   | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|--------------------|--------------------------------------------|--------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|------------|---|---|------------|----------|------------|----------|------------|------------|------|---|------|---|
| 1                  | Pre-and Post-Stress Electrical Test        |                    | -                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 2                  | High Temperature Exposure (Storage)        | Appearance         | No defects or abnormalities except color change of outer coating | Sit the capacitor for 1000±12h at 200±5°C. Let sit for 24±2h at room condition*, then measure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Capacitance Change | Within ±3% or ±0.3pF (Whichever is larger)                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Q                  | Q ≥ 350                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | I.R.               | 1000MΩ min.                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 3                  | Temperature Cycling                        | Appearance         | No defects or abnormalities except color change of outer coating | Perform the 1000 cycles according to the four heat treatments listed in the following table. Let sit for 24±2h at room condition*, then measure. <table><tr><th>Step</th><th>1</th><th>2</th><th>3</th><th>4</th></tr><tr><td>Temp. (°C)</td><td>-55+0/-3</td><td>Room Temp.</td><td>125+3/-0</td><td>Room Temp.</td></tr><tr><td>Time (min)</td><td>15±3</td><td>1</td><td>15±3</td><td>1</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Step       | 1        | 2          | 3 | 4 | Temp. (°C) | -55+0/-3 | Room Temp. | 125+3/-0 | Room Temp. | Time (min) | 15±3 | 1 | 15±3 | 1 |
|                    |                                            | Step               | 1                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2          | 3        | 4          |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Temp. (°C)         | -55+0/-3                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Room Temp. | 125+3/-0 | Room Temp. |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Time (min)         | 15±3                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1          | 15±3     | 1          |   |   |            |          |            |          |            |            |      |   |      |   |
| Capacitance Change | Within ±5% or ±0.5pF (Whichever is larger) |                    |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| Q                  | Q ≥ 350                                    |                    |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| I.R.               | 1000MΩ min.                                |                    |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 4                  | Moisture Resistance                        | Appearance         | No defects or abnormalities                                      | Apply the 24h heat (25 to 65°C) and humidity (80 to 98%) treatment shown below, 10 consecutive times. Let sit for 24±2h at room condition*, then measure. <div><div><div>Temperature (°C)</div><div>Humidity 90-98% Humidity 80-98% Humidity 90-98% Humidity 80-98% Humidity 90-98%</div><div><div><div>70</div><div>65</div><div>60</div><div>55</div><div>50</div><div>45</div><div>40</div><div>35</div><div>30</div><div>25</div><div>20</div><div>15</div><div>10</div><div>5</div><div>0</div><div>-5</div><div>-10</div></div><div><div>Initial measurement</div><div>-10°C</div></div></div><div><div>0</div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div><div>17</div><div>18</div><div>19</div><div>20</div><div>21</div><div>22</div><div>23</div><div>24</div></div><div>One cycle = 24 hours</div><div>Hours</div></div></div> |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Capacitance Change | Within ±5% or ±0.5pF (Whichever is larger)                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Q                  | Q ≥ 200                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | I.R.               | 500MΩ min.                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 5                  | Biased Humidity                            | Appearance         | No defects or abnormalities                                      | Apply the rated voltage and DC1.3+0.2/-0 V (add 100kΩ resistor) at 85±3°C and 80 to 85% humidity for 1000±12h. Remove and let sit for 24±2h at room condition*, then measure. The charge/discharge current is less than 50mA.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Capacitance Change | Within ±5% or ±0.5pF (Whichever is larger)                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Q                  | Q ≥ 200                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | I.R.               | 500MΩ min.                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 6                  | Operational Life                           | Appearance         | No defects or abnormalities except color change of outer coating | Apply 25% of the rated voltage for 1000±12h at 200±5°C. Let sit for 24±2h at room condition*, then measure The charge/discharge current is less than 50mA.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Capacitance Change | Within ±3% or ±0.3pF (Whichever is larger)                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Q                  | Q ≥ 350                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | I.R.               | 1000MΩ min.                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 7                  | External Visual                            |                    | No defects or abnormalities                                      | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 8                  | Physical Dimension                         |                    | Within the specified dimensions                                  | Using calipers and micrometers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 9                  | Marking                                    |                    | To be easily legible                                             | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 10                 | Resistance to Solvents                     | Appearance         | No defects or abnormalities                                      | Per MIL-STD-202 Method 215<br>Solvent 1: 1 part (by volume) of isopropyl alcohol<br>3 parts (by volume) of mineral spirits<br>Solvent 2: Terpene defluxer<br>Solvent 3: 42 parts (by volume) of water<br>1part (by volume) of propylene glycol monomethyl ether<br>1 part (by volume) of monoethanolamine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Capacitance        | Within the specified tolerance                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Q                  | Q ≥ 1000                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | I.R.               | 10000MΩ min.                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 11                 | Mechanical Shock                           | Appearance         | No defects or abnormalities                                      | Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks). The specified test pulse should be Half-sine and should have a duration: 0.5ms, peak value: 1500G and velocity change: 4.7m/s.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Capacitance        | Within the specified tolerance                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                            | Q                  | Q ≥ 1000                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

## Temperature Compensating Type Specifications and Test Methods

Continued from the preceding page. ↘

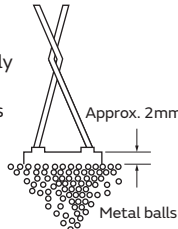
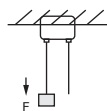
| No.          | AEC-Q200 Test Item                                   | Specifications                                                                                                      | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12           | Vibration                                            | Appearance                                                                                                          | The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 2000Hz. The frequency range, from 10 to 2000Hz and return to 10Hz, should be traversed in approximately 20min. This motion should be applied for 12 items in each 3 mutually perpendicular directions (total of 36 times). |
|              |                                                      | Capacitance                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Q                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>'<br>1 | Resistance to Soldering Heat (Non-Preheat)           | Appearance                                                                                                          | The lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 10±1s. Post-treatment Capacitor should be stored for 24±2h at room condition*.                                                                                                                                                                                                               |
|              |                                                      | Capacitance Change                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>'<br>2 | Resistance to Soldering Heat (On-Preheat)            | Appearance                                                                                                          | First the capacitor should be stored at 120+0/-5°C for 60+0/-5s. Then, the lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s. Post-treatment Capacitor should be stored for 24±2h at room condition*.                                                                                                                                    |
|              |                                                      | Capacitance Change                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>'<br>3 | Resistance to Soldering Heat (soldering iron method) | Appearance                                                                                                          | Test condition<br>Temperature of iron-tip: 350±10°C<br>Soldering time: 3.5±0.5s.<br>Soldering position<br>Straight Lead: 1.5 to 2.0mm from the root of terminal.<br>Crimp Lead: 1.5 to 2.0mm from the end of lead bend.<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                                                                                                     |
|              |                                                      | Capacitance Change                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 14           | Thermal Shock                                        | Appearance                                                                                                          | Perform the 300 cycles according to the two heat treatments listed in the following table (Maximum transfer time is 20s). Let sit for 24±2h at room condition*, then measure.                                                                                                                                                                                                                             |
|              |                                                      | Capacitance Change                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Q                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | I.R.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 15           | ESD                                                  | Appearance                                                                                                          | Per AEC-Q200-002                                                                                                                                                                                                                                                                                                                                                                                          |
|              |                                                      | Capacitance                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Q                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | I.R.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 16           | Solderability                                        | Lead wire should be soldered with uniform coating on the axial direction over 95% of the circumferential direction. | The terminal of a capacitor is dipped into a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight propotion) and then into molten solder (JIS-Z-3282) for 2±0.5s. In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body.<br>Temp. of solder:<br>245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu)                                                           |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

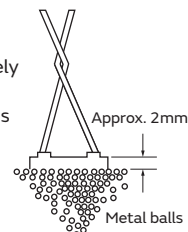
## Temperature Compensating Type Specifications and Test Methods

Continued from the preceding page. ↘

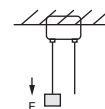
| No.                 | AEC-Q200 Test Item                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             | Specifications                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | AEC-Q200 Test Method                                                                                                                                                                                                                                                          |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|---------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|-----------------------------|-------------------------|------------------------------|------------|----------------------------------|-----------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|------|------------------|---|------|---|-------|---|------|---|-------|---|------|
| 17                  | Electrical Charac-<br>terization        | Appearance                                                                                                                                                                                                                                                                                                                                                                                                                                  | No defects or abnormalities              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Visual inspection                                                                                                                                                                                                                                                             |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                         | Capacitance                                                                                                                                                                                                                                                                                                                                                                                                                                 | Within the specified tolerance           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The capacitance, Q should be measured at 25°C at the frequency and voltage shown in the table.                                                                                                                                                                                |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                         | Q                                                                                                                                                                                                                                                                                                                                                                                                                                           | Q ≥ 1000                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <table><tr><th>Nominal Cap.</th><th>Frequency</th><th>Voltage</th></tr><tr><td>C &lt; 1000pF</td><td>1±0.1MHz</td><td>AC0.5 to 5V (r.m.s.)</td></tr><tr><td>C ≥ 1000pF</td><td>1±0.1kHz</td><td>AC1±0.2V (r.m.s.)</td></tr></table>                                           |                         |               | Nominal Cap.                | Frequency               | Voltage                      | C < 1000pF | 1±0.1MHz                         | AC0.5 to 5V (r.m.s.)        | C ≥ 1000pF                        | 1±0.1kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AC1±0.2V (r.m.s.) |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                         | Nominal Cap.                                                                                                                                                                                                                                                                                                                                                                                                                                | Frequency                                | Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                         | C < 1000pF                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1±0.1MHz                                 | AC0.5 to 5V (r.m.s.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                         | C ≥ 1000pF                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1±0.1kHz                                 | AC1±0.2V (r.m.s.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| I.R.                | Room Temperature                        | 10000MΩ min.                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          | The insulation resistance should be measured at 25±3°C with a DC voltage not exceeding the rated voltage at normal temperature and humidity and within 2min of charging. (Charge/Discharge current ≤ 50mA)                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     | High Temperature                        | 20MΩ min.                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                          | The insulation resistance should be measured at 200±5°C with a DC voltage not exceeding 25% of the rated voltage at normal temperature and humidity and within 2min of charging. (Charge/Discharge current ≤ 50mA)                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| Dielectric Strength | Between Terminals                       | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                 |                                          | The capacitor should not be damaged when voltage in table is applied between the terminations for 1 to 5s. (Charge/Discharge current ≤ 50mA.) <table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC100V</td><td>300% of the rated voltage</td></tr><tr><td>DC200V</td><td>250% of the rated voltage</td></tr><tr><td>DC500V</td><td>150% of the rated voltage</td></tr></table>                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         | Rated Voltage | Test Voltage                | DC100V                  | 300% of the rated voltage    | DC200V     | 250% of the rated voltage        | DC500V                      | 150% of the rated voltage         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     | Rated Voltage                           | Test Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| DC100V              | 300% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| DC200V              | 250% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| DC500V              | 150% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| Dielectric Strength | Body Insulation                         | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                 |                                          | The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuit, is kept approximately 2mm from the balls as shown in the figure, and voltage in table is impressed for 1 to 5s between capacitor terminals and metal balls. (Charge/Discharge current ≤ 50mA.)  <table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC100V, DC200V</td><td>250% of the rated voltage</td></tr><tr><td>DC500V</td><td>150% of the rated voltage</td></tr></table> |                                                                                                                                                                                                                                                                               |                         | Rated Voltage | Test Voltage                | DC100V, DC200V          | 250% of the rated voltage    | DC500V     | 150% of the rated voltage        |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     | Rated Voltage                           | Test Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| DC100V, DC200V      | 250% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| DC500V              | 150% of the rated voltage               |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 18                  | Terminal Strength                       | Tensile Strength                                                                                                                                                                                                                                                                                                                                                                                                                            | Termination not to be broken or loosened |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1s.  |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                         | Bending Strength                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Each lead wire should be subjected to a force of 2.5N and then be bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3s.                           |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 19                  | Capacitance Temperature Characteristics | Within the specified Tolerance <table><tr><th>Char.</th><th>Temperature Coefficient</th></tr><tr><td rowspan="3">CCG</td><td>-55 to 25°C: 0+30/-72ppm/°C</td></tr><tr><td>25 to 125°C: 0±30ppm/°C</td></tr><tr><td>125 to 200°C: 0+72/-30ppm/°C</td></tr><tr><td rowspan="3">UNJ</td><td>-55 to 25°C: -750+120/-347ppm/°C</td></tr><tr><td>25 to 125°C: -750±120ppm/°C</td></tr><tr><td>125 to 200°C: -750+347/-120ppm/°C</td></tr></table> |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Char.                                                                                                                                                                                                                                                                         | Temperature Coefficient | CCG           | -55 to 25°C: 0+30/-72ppm/°C | 25 to 125°C: 0±30ppm/°C | 125 to 200°C: 0+72/-30ppm/°C | UNJ        | -55 to 25°C: -750+120/-347ppm/°C | 25 to 125°C: -750±120ppm/°C | 125 to 200°C: -750+347/-120ppm/°C | The capacitance change should be measured after 5min at each specified temperature step. <table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>200±5</td></tr><tr><td>5</td><td>25±2</td></tr></table> The temperature coefficient is determind using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5 (-55 to +200°C) the capacitance should be within the specified tolerance for the temperature coefficient. The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in the step 1, 3 and 5 by the capacitance value in step 3. |                   |  | Step | Temperature (°C) | 1 | 25±2 | 2 | -55±3 | 3 | 25±2 | 4 | 200±5 | 5 | 25±2 |
|                     |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Char.                                                                                                                                                                                                                                                                         | Temperature Coefficient |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| CCG                 | -55 to 25°C: 0+30/-72ppm/°C             |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     | 25 to 125°C: 0±30ppm/°C                 |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     | 125 to 200°C: 0+72/-30ppm/°C            |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| UNJ                 | -55 to 25°C: -750+120/-347ppm/°C        |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     | 25 to 125°C: -750±120ppm/°C             |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     | 125 to 200°C: -750+347/-120ppm/°C       |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| Step                | Temperature (°C)                        |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 1                   | 25±2                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 2                   | -55±3                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 3                   | 25±2                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 4                   | 200±5                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 5                   | 25±2                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                               |                         |               |                             |                         |                              |            |                                  |                             |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |      |                  |   |      |   |       |   |      |   |       |   |      |

| Nominal Cap. | Frequency | Voltage              |
|--------------|-----------|----------------------|
| C < 1000pF   | 1±0.1MHz  | AC0.5 to 5V (r.m.s.) |
| C ≥ 1000pF   | 1±0.1kHz  | AC1±0.2V (r.m.s.)    |

| Rated Voltage | Test Voltage              |
|---------------|---------------------------|
| DC100V        | 300% of the rated voltage |
| DC200V        | 250% of the rated voltage |
| DC500V        | 150% of the rated voltage |



| Rated Voltage  | Test Voltage              |
|----------------|---------------------------|
| DC100V, DC200V | 250% of the rated voltage |
| DC500V         | 150% of the rated voltage |

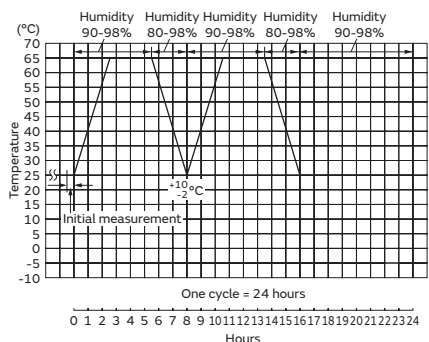


Each lead wire should be subjected to a force of 2.5N and then be bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3s.

| Step | Temperature (°C) |
|------|------------------|
| 1    | 25±2             |
| 2    | -55±3            |
| 3    | 25±2             |
| 4    | 200±5            |
| 5    | 25±2             |

The temperature coefficient is determined using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5 (-55 to +200°C) the capacitance should be within the specified tolerance for the temperature coefficient. The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in the step 1, 3 and 5 by the capacitance value in step 3.

## High Dielectric Constant Type Specifications and Test Methods

| No.                | AEC-Q200 Test Item                              |                    | Specifications                                                   | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|--------------------|-------------------------------------------------|--------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|------------|---|---|------------|----------|------------|----------|------------|------------|------|---|------|---|
| 1                  | Pre-and Post-Stress Electrical Test             |                    | -                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 2                  | High Temperature Exposure (Storage)             | Appearance         | No defects or abnormalities except color change of outer coating | Sit the capacitor for 1000±12h at 175±5°C. Let sit for 24±2h at room condition*, then measure.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 1h and then let sit for 24±2h at room condition*.                                                                                                                                                                                                                                                                                                                  |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | Capacitance Change | Within ±12.5%                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | D.F.               | Char. XAL: 0.075 max.<br>Char. XAN: 0.04 max.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | I.R.               | 1000MΩ or 50MΩ • μF min. (Whichever is smaller)                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 3                  | Temperature Cycling                             | Appearance         | No defects or abnormalities except color change of outer coating | Perform the 1000 cycles according to the four heat treatments listed in the following table. Let sit for 24±2h at room condition*, then measure.<br><table><tr><th>Step</th><th>1</th><th>2</th><th>3</th><th>4</th></tr><tr><td>Temp. (°C)</td><td>-55+0/-3</td><td>Room Temp.</td><td>175+5/-0</td><td>Room Temp.</td></tr><tr><td>Time (min)</td><td>15±3</td><td>1</td><td>15±3</td><td>1</td></tr></table><br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 1h and then let sit for 24±2h at room condition*. | Step       | 1        | 2          | 3 | 4 | Temp. (°C) | -55+0/-3 | Room Temp. | 175+5/-0 | Room Temp. | Time (min) | 15±3 | 1 | 15±3 | 1 |
|                    |                                                 | Step               | 1                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2          | 3        | 4          |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | Temp. (°C)         | -55+0/-3                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Room Temp. | 175+5/-0 | Room Temp. |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | Time (min)         | 15±3                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1          | 15±3     | 1          |   |   |            |          |            |          |            |            |      |   |      |   |
| Capacitance Change | Within ±12.5%                                   |                    |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| D.F.               | Char. XAL: 0.075 max.<br>Char. XAN: 0.05 max.   |                    |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| I.R.               | 1000MΩ or 50MΩ • μF min. (Whichever is smaller) |                    |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 4                  | Moisture Resistance                             | Appearance         | No defects or abnormalities                                      | Apply the 24h heat (25 to 65°C) and humidity (80 to 98%) treatment shown below, 10 consecutive times.<br>Let sit for 24±2h at room condition*, then measure.<br>                                                                                                                                                                                                                                                                                 |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | Capacitance Change | Within ±12.5%                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | D.F.               | Char. XAL: 0.075 max.<br>Char. XAN: 0.05 max.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | I.R.               | 500MΩ or 25MΩ • μF min. (Whichever is smaller)                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 5                  | Biased Humidity                                 | Appearance         | No defects or abnormalities                                      | Apply the rated voltage and DC1.3+0.2/-0 V (add 100kΩ resistor) at 85±3°C and 80 to 85% humidity for 1000±12h.<br>Remove and let sit for 24±2h at room condition*, then measure.<br>The charge/discharge current is less than 50mA.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 1h and then let sit for 24±2h at room condition*.                                                                                                                                                                             |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | Capacitance Change | Within ±12.5%                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | D.F.               | Char. XAL: 0.075 max.<br>Char. XAN: 0.05 max.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | I.R.               | 500MΩ or 25MΩ • μF min. (Whichever is smaller)                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 6                  | Operational Life                                | Appearance         | No defects or abnormalities except color change of outer coating | Apply 50% of the rated voltage for 1000±12h at 175±5°C.<br>Let sit for 24±2h at room condition*, then measure.<br>The charge/discharge current is less than 50mA.<br>•Pretreatment<br>Apply test voltage for 60±5min at test temperature.<br>Remove and let sit for 24±2h at room condition*.                                                                                                                                                                                                                                       |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | Capacitance Change | Within ±15%                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | D.F.               | Char. XAL: 0.075 max.<br>Char. XAN: 0.04 max.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | I.R.               | 100MΩ or 5MΩ • μF min. (Whichever is smaller)                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 7                  | External Visual                                 |                    | No defects or abnormalities                                      | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 8                  | Physical Dimension                              |                    | Within the specified dimensions                                  | Using calipers and micrometers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 9                  | Marking                                         |                    | To be easily legible                                             | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
| 10                 | Resistance to Solvents                          | Appearance         | No defects or abnormalities                                      | Per MIL-STD-202 Method 215<br>Solvent 1: 1 part (by volume) of isopropyl alcohol<br>3 parts (by volume) of mineral spirits<br>Solvent 2: Terpene defluxer<br>Solvent 3: 42 parts (by volume) of water<br>1part (by volume) of propylene glycol monomethyl ether<br>1 part (by volume) of monoethanolamine                                                                                                                                                                                                                           |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | Capacitance        | Within the specified tolerance                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | D.F.               | Char. XAL: 0.075 max.<br>Char. XAN: 0.025 max.                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |
|                    |                                                 | I.R.               | 10000MΩ or 500MΩ • μF min. (Whichever is smaller)                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |          |            |   |   |            |          |            |          |            |            |      |   |      |   |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ➔

## High Dielectric Constant Type Specifications and Test Methods

Continued from the preceding page. ↘

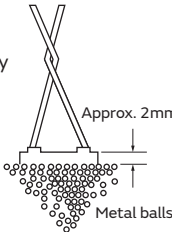
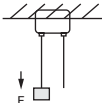
| No.          | AEC-Q200 Test Item                                   | Specifications                                                                                                      | AEC-Q200 Test Method                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11           | Mechanical Shock                                     | Appearance                                                                                                          | Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks). The specified test pulse should be Half-sine and should have a duration: 0.5ms, peak value: 1500G and velocity change: 4.7m/s.                                                                                                                                                                     |
|              |                                                      | Capacitance                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | D.F.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 12           | Vibration                                            | Appearance                                                                                                          | The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 2000Hz. The frequency range, from 10 to 2000Hz and return to 10Hz, should be traversed in approximately 20min. This motion should be applied for 12 items in each 3 mutually perpendicular directions (total of 36 times).                 |
|              |                                                      | Capacitance                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | D.F.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>'<br>1 | Resistance to Soldering Heat (Non-Preheat)           | Appearance                                                                                                          | The lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 10±1s.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 1h and then let sit for 24±2h at room condition*.<br>•Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                                                                                                    |
|              |                                                      | Capacitance Change                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>'<br>2 | Resistance to Soldering Heat (On-Preheat)            | Appearance                                                                                                          | First the capacitor should be stored at 120+0/-5°C for 60+0/-5s. Then, the lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 1h and then let sit for 24±2h at room condition*.<br>•Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                         |
|              |                                                      | Capacitance Change                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13<br>'<br>3 | Resistance to Soldering Heat (Soldering Iron Method) | Appearance                                                                                                          | Test condition<br>Temperature of iron-tip: 350±10°C<br>Soldering time: 3.5±0.5s<br>Soldering position<br>Straight Lead: 1.5 to 2.0mm from the root of terminal.<br>Crimp Lead: 1.5 to 2.0mm from the end of lead bend.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 1h and then let sit for 24±2h at room condition*.<br>•Post-treatment<br>Capacitor should be stored for 24±2h at room condition*. |
|              |                                                      | Capacitance Change                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | Dielectric Strength (Between Terminals)                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 14           | Thermal Shock                                        | Appearance                                                                                                          | Perform the 300 cycles according to the two heat treatments listed in the following table (Maximum transfer time is 20s). Let sit for 24±2h at room condition*, then measure.                                                                                                                                                                                                                                             |
|              |                                                      | Capacitance Change                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | D.F.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | I.R.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 15           | ESD                                                  | Appearance                                                                                                          | Per AEC-Q200-002                                                                                                                                                                                                                                                                                                                                                                                                          |
|              |                                                      | Capacitance                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | D.F.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                                      | I.R.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 16           | Solderability                                        | Lead wire should be soldered with uniform coating on the axial direction over 95% of the circumferential direction. | The terminal of a capacitor is dipped into a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion) and then into molten solder (JIS-Z-3282) for 2±0.5s. In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body.<br><br>Temp. of solder :<br>245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu)                                                                     |

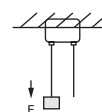
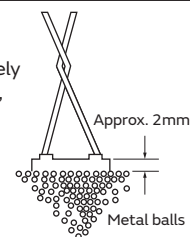
\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

## High Dielectric Constant Type Specifications and Test Methods

Continued from the preceding page. ↘

| No.                 | AEC-Q200 Test Item                                        |                                                                                                                                                                                                                                                                                                                   | Specifications                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                     | AEC-Q200 Test Method                                                                                                                                                                                                                                                             |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|---------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------|------------------|---|------|---|-------|---|------|---|-------|---|------|
| 17                  | Electrical Charac-<br>terization                          | Appearance                                                                                                                                                                                                                                                                                                        | No defects or abnormalities                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                     | Visual inspection                                                                                                                                                                                                                                                                |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                                           | Capacitance                                                                                                                                                                                                                                                                                                       | Within the specified tolerance                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                     | The capacitance, D.F. should be measured at 25°C at the frequency and voltage shown in the table.                                                                                                                                                                                |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                                           | D.F.                                                                                                                                                                                                                                                                                                              | Char. XAL: 0.075 max.<br>Char. XAN: 0.025 max.                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                     | <table><tr><th>Frequency</th><th>Voltage</th></tr><tr><td>1±0.1kHz</td><td>AC1±0.2V (r.m.s.)</td></tr></table>                                                                                                                                                                   | Frequency                                                                                                                                                                                                     | Voltage                                                   | 1±0.1kHz | AC1±0.2V (r.m.s.)                                         |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                                           | Frequency                                                                                                                                                                                                                                                                                                         | Voltage                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                                           | 1±0.1kHz                                                                                                                                                                                                                                                                                                          | AC1±0.2V (r.m.s.)                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                                           | I.R.                                                                                                                                                                                                                                                                                                              | Room Temperature                                                                                                                                                                                                      | 10000MΩ or 500MΩ • μF min.<br>(Whichever is smaller)                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                  | The insulation resistance should be measured at 25±3°C with a DC voltage not exceeding the rated voltage at normal temperature and humidity and within 2min of charging.<br>(Charge/Discharge current ≤ 50mA) |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| High Temperature    | 10MΩ or 0.5MΩ • μF min.<br>(Whichever is smaller)         |                                                                                                                                                                                                                                                                                                                   | The insulation resistance should be measured at 175±5°C with a DC voltage not exceeding 50% of the rated voltage at normal temperature and humidity and within 2min of charging.<br>(Charge/Discharge current ≤ 50mA) |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| Dielectric Strength | Between Terminals                                         | No defects or abnormalities                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                       | The capacitor should not be damaged when DC voltage of 250% of the rated voltage is applied between the terminations for 1 to 5s.<br>(Charge/Discharge current ≤ 50mA.)                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     | Body Insulation                                           | No defects or abnormalities                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                       | The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuit, is kept approximately 2mm from the balls as shown in the figure, and 250% of the rated DC voltage is impressed for 1 to 5s between capacitor terminals and metal balls.<br>(Charge/Discharge current ≤ 50mA.)<br> |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 18                  | Terminal Strength                                         | Tensile Strength                                                                                                                                                                                                                                                                                                  | Termination not to be broken or loosened                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                     | As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1s.<br> |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                                           | Bending Strength                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     | Each lead wire should be subjected to a force of 2.5N and then be bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3s.                              |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 19                  | Capacitance Temperature Characteristics                   | <div>Within the specified Tolerance</div> <table><tr><th>Char.</th><th>Capacitance Change</th></tr><tr><td>XAL</td><td>-55 to 150°C: Within ±15%<br/>150 to 175°C: Within+15/-40%</td></tr><tr><td>XAN</td><td>-55 to 125°C: Within ±15%<br/>125 to 175°C: Within+15/-60%</td></tr></table>                       |                                                                                                                                                                                                                       | Char.                                                                                                                                                                                                                                                                                                                                                                                                               | Capacitance Change                                                                                                                                                                                                                                                               | XAL                                                                                                                                                                                                           | -55 to 150°C: Within ±15%<br>150 to 175°C: Within+15/-40% | XAN      | -55 to 125°C: Within ±15%<br>125 to 175°C: Within+15/-60% | The capacitance change should be measured after 5min at each specified temperature step.<br><table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>175±5</td></tr><tr><td>5</td><td>25±2</td></tr></table> |  | Step | Temperature (°C) | 1 | 25±2 | 2 | -55±3 | 3 | 25±2 | 4 | 175±5 | 5 | 25±2 |
|                     |                                                           |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       | Char.                                                                                                                                                                                                                                                                                                                                                                                                               | Capacitance Change                                                                                                                                                                                                                                                               |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                                           |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       | XAL                                                                                                                                                                                                                                                                                                                                                                                                                 | -55 to 150°C: Within ±15%<br>150 to 175°C: Within+15/-40%                                                                                                                                                                                                                        |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| XAN                 | -55 to 125°C: Within ±15%<br>125 to 175°C: Within+15/-60% |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| Step                | Temperature (°C)                                          |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 1                   | 25±2                                                      |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 2                   | -55±3                                                     |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 3                   | 25±2                                                      |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 4                   | 175±5                                                     |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 5                   | 25±2                                                      |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |
|                     |                                                           | The ranges of capacitance change compared with the above 25°C value over the temperature ranges shown in the table should be within the specified ranges.<br>•Pretreatment<br>Perform the heat treatment at 150+0/-10°C for 1h and then let sit for 24±2h at room condition*.<br>Perform the initial measurement. |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                           |          |                                                           |                                                                                                                                                                                                                                                                                                                              |  |      |                  |   |      |   |       |   |      |   |       |   |      |



\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

# Leaded MLCC for General Purpose

## RDE Series (DC25V-DC1kV)

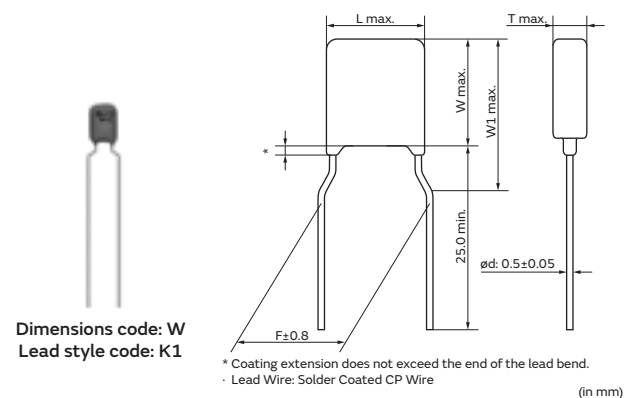
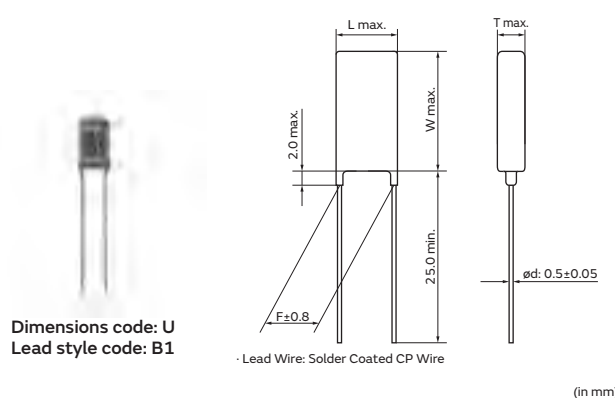
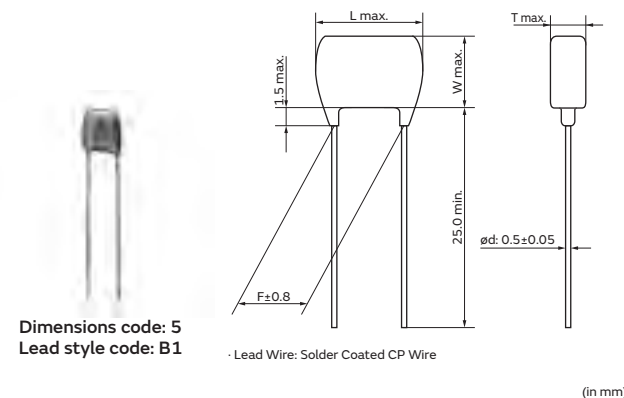
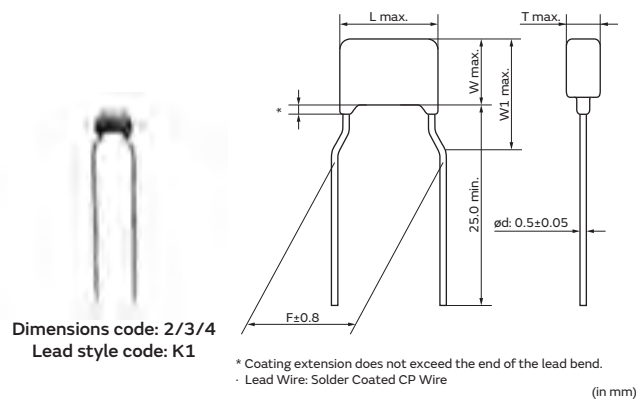
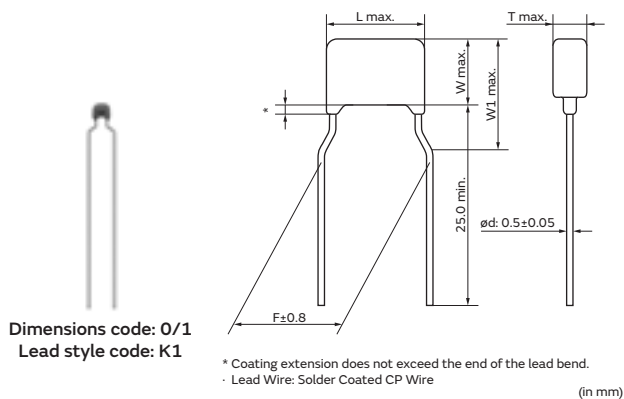
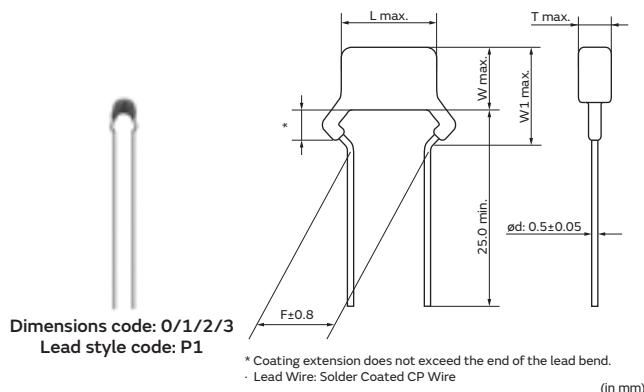
### Features

1. Small size and large capacitance
2. Low ESR characteristics for high frequency
3. Meet LF (Lead Free) and HF (Halogen Free)
4. Flow soldering is available, but re-flow soldering is not available.

### Applications

General electronic equipment

(Do not use for automotive-related power train and safety equipment.)



### Dimensions

| Dimensions and Lead Style Code | Dimensions (mm) |       |      |                                          |     |     |
|--------------------------------|-----------------|-------|------|------------------------------------------|-----|-----|
|                                | L               | W     | W1   | T                                        | F   | d   |
| 0P1/0S1                        | 5.0             | 3.5   | 6.0  | See the individual product specification | 2.5 | 0.5 |
| 0K1/0M1                        | 4.0             | 3.5   | 6.0  |                                          | 5.0 | 0.5 |
| 1P1/1S1                        | 5.0             | 3.5   | 5.0  |                                          | 2.5 | 0.5 |
| 1K1/1M1                        | 4.5             | 3.5   | 5.0  |                                          | 5.0 | 0.5 |
| 2P1/2S1                        | 5.5             | 4.0   | 6.0  |                                          | 2.5 | 0.5 |
| 2K1/2M1                        | 5.5             | 4.0   | 6.0  |                                          | 5.0 | 0.5 |
| 3P1/3S1                        | 5.5             | 5.0   | 7.5  |                                          | 2.5 | 0.5 |
| 3K1/3M1                        | 5.5             | 5.0   | 7.5  |                                          | 5.0 | 0.5 |
| 4K1/4M1                        | 7.5             | 5.5   | 8.0  |                                          | 5.0 | 0.5 |
| 5B1/5E1                        | 7.5             | 7.5*  | -    |                                          | 5.0 | 0.5 |
| UB1/UE1                        | 7.7             | 12.5* | -    |                                          | 5.0 | 0.5 |
| WK1/WM1                        | 5.5             | 7.5   | 10.0 |                                          | 5.0 | 0.5 |

\*DC630V, DC1kV: W+0.5mm

## Marking

| Dimensions Code               | Rated Voltage | DC25V                                                                                                                                                   |      | DC50V     |           |           | DC100V    |           |           | DC250V                                                | DC500V          | DC630V                                                | DC1kV                                                 |
|-------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------------------------------------|-----------------|-------------------------------------------------------|-------------------------------------------------------|
|                               | Temp. Char.   | X7S                                                                                                                                                     | X7R  | C0G       | X7S       | X7R       | C0G       | X7S       | X7R       | X7R, U2J, C0G                                         |                 |                                                       |                                                       |
| 0                             |               |                                                                                                                                                         | 104K |           | -         |           |           | -         |           | -                                                     |                 | -                                                     | -                                                     |
| 1                             |               | 224K                                                                                                                                                    | -    | A 102J    | -         | 224K      | A 102J    | -         | 224K      | U 102J (U2J)<br>102K (X7R)                            | 103K (X7R)      | -                                                     | -                                                     |
| 2                             |               | M 475 K2C                                                                                                                                               | -    | M 563 J5A | M 475 K5C | M 105 K5C | M 103 J1A | -         | M 105 K1C | M 103 J4U (U2J)<br>M 473 K4C (X7R)<br>M 153 J4A (C0G) | M 153 K9C (X7R) | M 472 J7U (U2J)<br>M 153 K7C (X7R)<br>M 332 J7A (C0G) | M 102 JAU (U2J)<br>M 102 KAC (X7R)<br>M 102 JAA (C0G) |
| 3, 4, W                       |               | M 226 K2C                                                                                                                                               | -    | -         | M 226 K5C | M 335 K5C | -         | M 225 K1C | -         | M 473 J4U (U2J)<br>M 224 K4C (X7R)                    | M 104 K9C (X7R) | M 103 J7U (U2J)<br>M 104 K7C (X7R)                    | M 472 JAU (U2J)<br>M 333 KAC (X7R)                    |
| 5, U                          |               | -                                                                                                                                                       | -    | -         | -         | -         | -         | -         | -         | -<br>M 474 K4C (X7R)                                  | M 474 K9C (X7R) | M 333 J7U (U2J)<br>M 474 M7C (X7R)                    | M 103 JAU (U2J)<br>M 104 KAC (X7R)                    |
| Temperature Characteristics   |               | Marked with code (C0G char.: A, X7S/X7R char.: C, U2J char.: U)<br>A part is omitted (Please refer to the marking example.)                             |      |           |           |           |           |           |           |                                                       |                 |                                                       |                                                       |
| Nominal Capacitance           |               | Under 100pF: Actual value    100pF and over: Marked with 3 figures                                                                                      |      |           |           |           |           |           |           |                                                       |                 |                                                       |                                                       |
| Capacitance Tolerance         |               | Marked with code<br>A part is omitted (Please refer to the marking example.)                                                                            |      |           |           |           |           |           |           |                                                       |                 |                                                       |                                                       |
| Rated Voltage                 |               | Marked with code (DC25V: 2, DC50V: 5, DC100V: 1, DC250V: 4, DC500V: 9, DC630V: 7, DC1kV: A)<br>A part is omitted (Please refer to the marking example.) |      |           |           |           |           |           |           |                                                       |                 |                                                       |                                                       |
| Manufacturer's Identification |               | Marked with M<br>A part is omitted (Please refer to the marking example.)                                                                               |      |           |           |           |           |           |           |                                                       |                 |                                                       |                                                       |

## Temperature Compensating Type, C0G/U2J Characteristics

| Part Number        | Temp. Char. | Rated Voltage | Capacitance  | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|--------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RDE5C1H1R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 1.0pF±0.25pF | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDE5C1H1R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 1.0pF±0.25pF | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDE5C1H2R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 2.0pF±0.25pF | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDE5C1H2R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 2.0pF±0.25pF | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDE5C1H3R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 3.0pF±0.25pF | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDE5C1H3R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 3.0pF±0.25pF | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDE5C1H4R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 4.0pF±0.25pF | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDE5C1H4R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 4.0pF±0.25pF | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDE5C1H5R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 5.0pF±0.25pF | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDE5C1H5R0C0□□H03□ | C0G (EIA)   | 50Vdc         | 5.0pF±0.25pF | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |

Continued on the following page. ➤

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RDE5C1H6R0D0□□H03□ | COG (EIA)      | 50Vdc            | 6.0pF±0.5pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H6R0D0□□H03□ | COG (EIA)      | 50Vdc            | 6.0pF±0.5pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H7R0D0□□H03□ | COG (EIA)      | 50Vdc            | 7.0pF±0.5pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H7R0D0□□H03□ | COG (EIA)      | 50Vdc            | 7.0pF±0.5pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H8R0D0□□H03□ | COG (EIA)      | 50Vdc            | 8.0pF±0.5pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H8R0D0□□H03□ | COG (EIA)      | 50Vdc            | 8.0pF±0.5pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H9R0D0□□H03□ | COG (EIA)      | 50Vdc            | 9.0pF±0.5pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H9R0D0□□H03□ | COG (EIA)      | 50Vdc            | 9.0pF±0.5pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H100J0□□H03□ | COG (EIA)      | 50Vdc            | 10pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H100J0□□H03□ | COG (EIA)      | 50Vdc            | 10pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H120J0□□H03□ | COG (EIA)      | 50Vdc            | 12pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H120J0□□H03□ | COG (EIA)      | 50Vdc            | 12pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H150J0□□H03□ | COG (EIA)      | 50Vdc            | 15pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H150J0□□H03□ | COG (EIA)      | 50Vdc            | 15pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H180J0□□H03□ | COG (EIA)      | 50Vdc            | 18pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H180J0□□H03□ | COG (EIA)      | 50Vdc            | 18pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H220J0□□H03□ | COG (EIA)      | 50Vdc            | 22pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H220J0□□H03□ | COG (EIA)      | 50Vdc            | 22pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H270J0□□H03□ | COG (EIA)      | 50Vdc            | 27pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H270J0□□H03□ | COG (EIA)      | 50Vdc            | 27pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H330J0□□H03□ | COG (EIA)      | 50Vdc            | 33pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H330J0□□H03□ | COG (EIA)      | 50Vdc            | 33pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H390J0□□H03□ | COG (EIA)      | 50Vdc            | 39pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H390J0□□H03□ | COG (EIA)      | 50Vdc            | 39pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H470J0□□H03□ | COG (EIA)      | 50Vdc            | 47pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H470J0□□H03□ | COG (EIA)      | 50Vdc            | 47pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H560J0□□H03□ | COG (EIA)      | 50Vdc            | 56pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H560J0□□H03□ | COG (EIA)      | 50Vdc            | 56pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H680J0□□H03□ | COG (EIA)      | 50Vdc            | 68pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H680J0□□H03□ | COG (EIA)      | 50Vdc            | 68pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H820J0□□H03□ | COG (EIA)      | 50Vdc            | 82pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H820J0□□H03□ | COG (EIA)      | 50Vdc            | 82pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H101J0□□H03□ | COG (EIA)      | 50Vdc            | 100pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H101J0□□H03□ | COG (EIA)      | 50Vdc            | 100pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H121J0□□H03□ | COG (EIA)      | 50Vdc            | 120pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H121J0□□H03□ | COG (EIA)      | 50Vdc            | 120pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H151J0□□H03□ | COG (EIA)      | 50Vdc            | 150pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H151J0□□H03□ | COG (EIA)      | 50Vdc            | 150pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H181J0□□H03□ | COG (EIA)      | 50Vdc            | 180pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H181J0□□H03□ | COG (EIA)      | 50Vdc            | 180pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H221J0□□H03□ | COG (EIA)      | 50Vdc            | 220pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H221J0□□H03□ | COG (EIA)      | 50Vdc            | 220pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H271J0□□H03□ | COG (EIA)      | 50Vdc            | 270pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H271J0□□H03□ | COG (EIA)      | 50Vdc            | 270pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H331J0□□H03□ | COG (EIA)      | 50Vdc            | 330pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H331J0□□H03□ | COG (EIA)      | 50Vdc            | 330pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H391J0□□H03□ | COG (EIA)      | 50Vdc            | 390pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H391J0□□H03□ | COG (EIA)      | 50Vdc            | 390pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H471J0□□H03□ | COG (EIA)      | 50Vdc            | 470pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H471J0□□H03□ | COG (EIA)      | 50Vdc            | 470pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H561J0□□H03□ | COG (EIA)      | 50Vdc            | 560pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H561J0□□H03□ | COG (EIA)      | 50Vdc            | 560pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H681J0□□H03□ | COG (EIA)      | 50Vdc            | 680pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H681J0□□H03□ | COG (EIA)      | 50Vdc            | 680pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H821J0□□H03□ | COG (EIA)      | 50Vdc            | 820pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H821J0□□H03□ | COG (EIA)      | 50Vdc            | 820pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H102J0□□H03□ | COG (EIA)      | 50Vdc            | 1000pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance  | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|--------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RDE5C1H102J0□□H03□ | COG (EIA)      | 50Vdc            | 1000pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H122J0□□H03□ | COG (EIA)      | 50Vdc            | 1200pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H122J0□□H03□ | COG (EIA)      | 50Vdc            | 1200pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H152J0□□H03□ | COG (EIA)      | 50Vdc            | 1500pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H152J0□□H03□ | COG (EIA)      | 50Vdc            | 1500pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H182J0□□H03□ | COG (EIA)      | 50Vdc            | 1800pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H182J0□□H03□ | COG (EIA)      | 50Vdc            | 1800pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H222J0□□H03□ | COG (EIA)      | 50Vdc            | 2200pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H222J0□□H03□ | COG (EIA)      | 50Vdc            | 2200pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H272J0□□H03□ | COG (EIA)      | 50Vdc            | 2700pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H272J0□□H03□ | COG (EIA)      | 50Vdc            | 2700pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H332J0□□H03□ | COG (EIA)      | 50Vdc            | 3300pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H332J0□□H03□ | COG (EIA)      | 50Vdc            | 3300pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H392J0□□H03□ | COG (EIA)      | 50Vdc            | 3900pF±5%    | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C1H392J0□□H03□ | COG (EIA)      | 50Vdc            | 3900pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C1H472J1□□H03□ | COG (EIA)      | 50Vdc            | 4700pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H472J1□□H03□ | COG (EIA)      | 50Vdc            | 4700pF±5%    | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H562J1□□H03□ | COG (EIA)      | 50Vdc            | 5600pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H562J1□□H03□ | COG (EIA)      | 50Vdc            | 5600pF±5%    | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H682J1□□H03□ | COG (EIA)      | 50Vdc            | 6800pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H682J1□□H03□ | COG (EIA)      | 50Vdc            | 6800pF±5%    | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H822J1□□H03□ | COG (EIA)      | 50Vdc            | 8200pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H822J1□□H03□ | COG (EIA)      | 50Vdc            | 8200pF±5%    | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H103J1□□H03□ | COG (EIA)      | 50Vdc            | 10000pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H103J1□□H03□ | COG (EIA)      | 50Vdc            | 10000pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H123J1□□H03□ | COG (EIA)      | 50Vdc            | 12000pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H123J1□□H03□ | COG (EIA)      | 50Vdc            | 12000pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H153J1□□H03□ | COG (EIA)      | 50Vdc            | 15000pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H153J1□□H03□ | COG (EIA)      | 50Vdc            | 15000pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H183J1□□H03□ | COG (EIA)      | 50Vdc            | 18000pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H183J1□□H03□ | COG (EIA)      | 50Vdc            | 18000pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H223J1□□H03□ | COG (EIA)      | 50Vdc            | 22000pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H223J1□□H03□ | COG (EIA)      | 50Vdc            | 22000pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H273J2□□H03□ | COG (EIA)      | 50Vdc            | 27000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H273J2□□H03□ | COG (EIA)      | 50Vdc            | 27000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H333J2□□H03□ | COG (EIA)      | 50Vdc            | 33000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H333J2□□H03□ | COG (EIA)      | 50Vdc            | 33000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H393J2□□H03□ | COG (EIA)      | 50Vdc            | 39000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H393J2□□H03□ | COG (EIA)      | 50Vdc            | 39000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H473J2□□H03□ | COG (EIA)      | 50Vdc            | 47000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H473J2□□H03□ | COG (EIA)      | 50Vdc            | 47000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H563J2□□H03□ | COG (EIA)      | 50Vdc            | 56000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H563J2□□H03□ | COG (EIA)      | 50Vdc            | 56000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H683J2□□H03□ | COG (EIA)      | 50Vdc            | 68000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H683J2□□H03□ | COG (EIA)      | 50Vdc            | 68000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H823J2□□H03□ | COG (EIA)      | 50Vdc            | 82000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H823J2□□H03□ | COG (EIA)      | 50Vdc            | 82000pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C1H104J2□□H03□ | COG (EIA)      | 50Vdc            | 0.1μF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C1H104J2□□H03□ | COG (EIA)      | 50Vdc            | 0.1μF±5%     | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A1R0C0□□H03□ | COG (EIA)      | 100Vdc           | 1.0pF±0.25pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A1R0C0□□H03□ | COG (EIA)      | 100Vdc           | 1.0pF±0.25pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A2R0C0□□H03□ | COG (EIA)      | 100Vdc           | 2.0pF±0.25pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A2R0C0□□H03□ | COG (EIA)      | 100Vdc           | 2.0pF±0.25pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A3R0C0□□H03□ | COG (EIA)      | 100Vdc           | 3.0pF±0.25pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A3R0C0□□H03□ | COG (EIA)      | 100Vdc           | 3.0pF±0.25pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A4R0C0□□H03□ | COG (EIA)      | 100Vdc           | 4.0pF±0.25pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A4R0C0□□H03□ | COG (EIA)      | 100Vdc           | 4.0pF±0.25pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance  | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|--------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RDE5C2A5R0C0□□H03□ | COG (EIA)      | 100Vdc           | 5.0pF±0.25pF | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A5R0C0□□H03□ | COG (EIA)      | 100Vdc           | 5.0pF±0.25pF | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A6R0D0□□H03□ | COG (EIA)      | 100Vdc           | 6.0pF±0.5pF  | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A6R0D0□□H03□ | COG (EIA)      | 100Vdc           | 6.0pF±0.5pF  | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A7R0D0□□H03□ | COG (EIA)      | 100Vdc           | 7.0pF±0.5pF  | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A7R0D0□□H03□ | COG (EIA)      | 100Vdc           | 7.0pF±0.5pF  | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A8R0D0□□H03□ | COG (EIA)      | 100Vdc           | 8.0pF±0.5pF  | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A8R0D0□□H03□ | COG (EIA)      | 100Vdc           | 8.0pF±0.5pF  | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A9R0D0□□H03□ | COG (EIA)      | 100Vdc           | 9.0pF±0.5pF  | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A9R0D0□□H03□ | COG (EIA)      | 100Vdc           | 9.0pF±0.5pF  | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A100J0□□H03□ | COG (EIA)      | 100Vdc           | 10pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A100J0□□H03□ | COG (EIA)      | 100Vdc           | 10pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A120J0□□H03□ | COG (EIA)      | 100Vdc           | 12pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A120J0□□H03□ | COG (EIA)      | 100Vdc           | 12pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A150J0□□H03□ | COG (EIA)      | 100Vdc           | 15pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A150J0□□H03□ | COG (EIA)      | 100Vdc           | 15pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A180J0□□H03□ | COG (EIA)      | 100Vdc           | 18pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A180J0□□H03□ | COG (EIA)      | 100Vdc           | 18pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A220J0□□H03□ | COG (EIA)      | 100Vdc           | 22pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A220J0□□H03□ | COG (EIA)      | 100Vdc           | 22pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A270J0□□H03□ | COG (EIA)      | 100Vdc           | 27pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A270J0□□H03□ | COG (EIA)      | 100Vdc           | 27pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A330J0□□H03□ | COG (EIA)      | 100Vdc           | 33pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A330J0□□H03□ | COG (EIA)      | 100Vdc           | 33pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A390J0□□H03□ | COG (EIA)      | 100Vdc           | 39pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A390J0□□H03□ | COG (EIA)      | 100Vdc           | 39pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A470J0□□H03□ | COG (EIA)      | 100Vdc           | 47pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A470J0□□H03□ | COG (EIA)      | 100Vdc           | 47pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A560J0□□H03□ | COG (EIA)      | 100Vdc           | 56pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A560J0□□H03□ | COG (EIA)      | 100Vdc           | 56pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A680J0□□H03□ | COG (EIA)      | 100Vdc           | 68pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A680J0□□H03□ | COG (EIA)      | 100Vdc           | 68pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A820J0□□H03□ | COG (EIA)      | 100Vdc           | 82pF±5%      | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A820J0□□H03□ | COG (EIA)      | 100Vdc           | 82pF±5%      | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A101J0□□H03□ | COG (EIA)      | 100Vdc           | 100pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A101J0□□H03□ | COG (EIA)      | 100Vdc           | 100pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A121J0□□H03□ | COG (EIA)      | 100Vdc           | 120pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A121J0□□H03□ | COG (EIA)      | 100Vdc           | 120pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A151J0□□H03□ | COG (EIA)      | 100Vdc           | 150pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A151J0□□H03□ | COG (EIA)      | 100Vdc           | 150pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A181J0□□H03□ | COG (EIA)      | 100Vdc           | 180pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A181J0□□H03□ | COG (EIA)      | 100Vdc           | 180pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A221J0□□H03□ | COG (EIA)      | 100Vdc           | 220pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A221J0□□H03□ | COG (EIA)      | 100Vdc           | 220pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A271J0□□H03□ | COG (EIA)      | 100Vdc           | 270pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A271J0□□H03□ | COG (EIA)      | 100Vdc           | 270pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A331J0□□H03□ | COG (EIA)      | 100Vdc           | 330pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A331J0□□H03□ | COG (EIA)      | 100Vdc           | 330pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A391J0□□H03□ | COG (EIA)      | 100Vdc           | 390pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A391J0□□H03□ | COG (EIA)      | 100Vdc           | 390pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A471J0□□H03□ | COG (EIA)      | 100Vdc           | 470pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A471J0□□H03□ | COG (EIA)      | 100Vdc           | 470pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A561J0□□H03□ | COG (EIA)      | 100Vdc           | 560pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A561J0□□H03□ | COG (EIA)      | 100Vdc           | 560pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A681J0□□H03□ | COG (EIA)      | 100Vdc           | 680pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A681J0□□H03□ | COG (EIA)      | 100Vdc           | 680pF±5%     | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A821J0□□H03□ | COG (EIA)      | 100Vdc           | 820pF±5%     | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RDE5C2A821J0□□H03□ | COG (EIA)      | 100Vdc           | 820pF±5%    | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A102J0□□H03□ | COG (EIA)      | 100Vdc           | 1000pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A102J0□□H03□ | COG (EIA)      | 100Vdc           | 1000pF±5%   | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A122J0□□H03□ | COG (EIA)      | 100Vdc           | 1200pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A122J0□□H03□ | COG (EIA)      | 100Vdc           | 1200pF±5%   | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A152J0□□H03□ | COG (EIA)      | 100Vdc           | 1500pF±5%   | 4.0×3.5                   | 2.5                    | 5.0                     | K1                         | M1                           |
| RDE5C2A152J0□□H03□ | COG (EIA)      | 100Vdc           | 1500pF±5%   | 5.0×3.5                   | 2.5                    | 2.5                     | P1                         | S1                           |
| RDE5C2A182J1□□H03□ | COG (EIA)      | 100Vdc           | 1800pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A182J1□□H03□ | COG (EIA)      | 100Vdc           | 1800pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A222J1□□H03□ | COG (EIA)      | 100Vdc           | 2200pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A222J1□□H03□ | COG (EIA)      | 100Vdc           | 2200pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A272J1□□H03□ | COG (EIA)      | 100Vdc           | 2700pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A272J1□□H03□ | COG (EIA)      | 100Vdc           | 2700pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A332J1□□H03□ | COG (EIA)      | 100Vdc           | 3300pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A332J1□□H03□ | COG (EIA)      | 100Vdc           | 3300pF±5%   | 5.0×3.5                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A392J2□□H03□ | COG (EIA)      | 100Vdc           | 3900pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A392J2□□H03□ | COG (EIA)      | 100Vdc           | 3900pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A472J2□□H03□ | COG (EIA)      | 100Vdc           | 4700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A472J2□□H03□ | COG (EIA)      | 100Vdc           | 4700pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A562J2□□H03□ | COG (EIA)      | 100Vdc           | 5600pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A562J2□□H03□ | COG (EIA)      | 100Vdc           | 5600pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A682J2□□H03□ | COG (EIA)      | 100Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A682J2□□H03□ | COG (EIA)      | 100Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A822J2□□H03□ | COG (EIA)      | 100Vdc           | 8200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A822J2□□H03□ | COG (EIA)      | 100Vdc           | 8200pF±5%   | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A103J2□□H03□ | COG (EIA)      | 100Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A103J2□□H03□ | COG (EIA)      | 100Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A123J2□□H03□ | COG (EIA)      | 100Vdc           | 12000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A123J2□□H03□ | COG (EIA)      | 100Vdc           | 12000pF±5%  | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A153J2□□H03□ | COG (EIA)      | 100Vdc           | 15000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A153J2□□H03□ | COG (EIA)      | 100Vdc           | 15000pF±5%  | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A183J2□□H03□ | COG (EIA)      | 100Vdc           | 18000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A183J2□□H03□ | COG (EIA)      | 100Vdc           | 18000pF±5%  | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2A223J2□□H03□ | COG (EIA)      | 100Vdc           | 22000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2A223J2□□H03□ | COG (EIA)      | 100Vdc           | 22000pF±5%  | 5.5×4.0                   | 3.15                   | 2.5                     | P1                         | S1                           |
| RDE5C2E100J2□□H03□ | COG (EIA)      | 250Vdc           | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E120J2□□H03□ | COG (EIA)      | 250Vdc           | 12pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E150J2□□H03□ | COG (EIA)      | 250Vdc           | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E180J2□□H03□ | COG (EIA)      | 250Vdc           | 18pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E220J2□□H03□ | COG (EIA)      | 250Vdc           | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E270J2□□H03□ | COG (EIA)      | 250Vdc           | 27pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E330J2□□H03□ | COG (EIA)      | 250Vdc           | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E390J2□□H03□ | COG (EIA)      | 250Vdc           | 39pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E470J2□□H03□ | COG (EIA)      | 250Vdc           | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E560J2□□H03□ | COG (EIA)      | 250Vdc           | 56pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E680J2□□H03□ | COG (EIA)      | 250Vdc           | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E820J2□□H03□ | COG (EIA)      | 250Vdc           | 82pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E101J2□□H03□ | COG (EIA)      | 250Vdc           | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E121J2□□H03□ | COG (EIA)      | 250Vdc           | 120pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E151J2□□H03□ | COG (EIA)      | 250Vdc           | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E181J2□□H03□ | COG (EIA)      | 250Vdc           | 180pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E221J2□□H03□ | COG (EIA)      | 250Vdc           | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E271J2□□H03□ | COG (EIA)      | 250Vdc           | 270pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E331J2□□H03□ | COG (EIA)      | 250Vdc           | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E391J2□□H03□ | COG (EIA)      | 250Vdc           | 390pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E471J2□□H03□ | COG (EIA)      | 250Vdc           | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E561J2□□H03□ | COG (EIA)      | 250Vdc           | 560pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RDE5C2E681J2□□H03□ | COG (EIA)      | 250Vdc           | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E821J2□□H03□ | COG (EIA)      | 250Vdc           | 820pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E102J2□□H03□ | COG (EIA)      | 250Vdc           | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E122J2□□H03□ | COG (EIA)      | 250Vdc           | 1200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E152J2□□H03□ | COG (EIA)      | 250Vdc           | 1500pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E182J2□□H03□ | COG (EIA)      | 250Vdc           | 1800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E222J2□□H03□ | COG (EIA)      | 250Vdc           | 2200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E272J2□□H03□ | COG (EIA)      | 250Vdc           | 2700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E332J2□□H03□ | COG (EIA)      | 250Vdc           | 3300pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E392J2□□H03□ | COG (EIA)      | 250Vdc           | 3900pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E472J2□□H03□ | COG (EIA)      | 250Vdc           | 4700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E562J2□□H03□ | COG (EIA)      | 250Vdc           | 5600pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E682J2□□H03□ | COG (EIA)      | 250Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E822J2□□H03□ | COG (EIA)      | 250Vdc           | 8200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E103J2□□H03□ | COG (EIA)      | 250Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E123J2□□H03□ | COG (EIA)      | 250Vdc           | 12000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2E153J2□□H03□ | COG (EIA)      | 250Vdc           | 15000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J100J2□□H03□ | COG (EIA)      | 630Vdc           | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J120J2□□H03□ | COG (EIA)      | 630Vdc           | 12pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J150J2□□H03□ | COG (EIA)      | 630Vdc           | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J180J2□□H03□ | COG (EIA)      | 630Vdc           | 18pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J220J2□□H03□ | COG (EIA)      | 630Vdc           | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J270J2□□H03□ | COG (EIA)      | 630Vdc           | 27pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J330J2□□H03□ | COG (EIA)      | 630Vdc           | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J390J2□□H03□ | COG (EIA)      | 630Vdc           | 39pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J470J2□□H03□ | COG (EIA)      | 630Vdc           | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J560J2□□H03□ | COG (EIA)      | 630Vdc           | 56pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J680J2□□H03□ | COG (EIA)      | 630Vdc           | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J820J2□□H03□ | COG (EIA)      | 630Vdc           | 82pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J101J2□□H03□ | COG (EIA)      | 630Vdc           | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J121J2□□H03□ | COG (EIA)      | 630Vdc           | 120pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J151J2□□H03□ | COG (EIA)      | 630Vdc           | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J181J2□□H03□ | COG (EIA)      | 630Vdc           | 180pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J221J2□□H03□ | COG (EIA)      | 630Vdc           | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J271J2□□H03□ | COG (EIA)      | 630Vdc           | 270pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J331J2□□H03□ | COG (EIA)      | 630Vdc           | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J391J2□□H03□ | COG (EIA)      | 630Vdc           | 390pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J471J2□□H03□ | COG (EIA)      | 630Vdc           | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J561J2□□H03□ | COG (EIA)      | 630Vdc           | 560pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J681J2□□H03□ | COG (EIA)      | 630Vdc           | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J821J2□□H03□ | COG (EIA)      | 630Vdc           | 820pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J102J2□□H03□ | COG (EIA)      | 630Vdc           | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J122J2□□H03□ | COG (EIA)      | 630Vdc           | 1200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J152J2□□H03□ | COG (EIA)      | 630Vdc           | 1500pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J182J2□□H03□ | COG (EIA)      | 630Vdc           | 1800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J222J2□□H03□ | COG (EIA)      | 630Vdc           | 2200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J272J2□□H03□ | COG (EIA)      | 630Vdc           | 2700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C2J332J2□□H03□ | COG (EIA)      | 630Vdc           | 3300pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A100J2□□H03□ | COG (EIA)      | 1000Vdc          | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A120J2□□H03□ | COG (EIA)      | 1000Vdc          | 12pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A150J2□□H03□ | COG (EIA)      | 1000Vdc          | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A180J2□□H03□ | COG (EIA)      | 1000Vdc          | 18pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A220J2□□H03□ | COG (EIA)      | 1000Vdc          | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A270J2□□H03□ | COG (EIA)      | 1000Vdc          | 27pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A330J2□□H03□ | COG (EIA)      | 1000Vdc          | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A390J2□□H03□ | COG (EIA)      | 1000Vdc          | 39pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A470J2□□H03□ | COG (EIA)      | 1000Vdc          | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|--------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| RDE5C3A560J2□□H03□ | COG (EIA)      | 1000Vdc          | 56pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A680J2□□H03□ | COG (EIA)      | 1000Vdc          | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A820J2□□H03□ | COG (EIA)      | 1000Vdc          | 82pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A101J2□□H03□ | COG (EIA)      | 1000Vdc          | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A121J2□□H03□ | COG (EIA)      | 1000Vdc          | 120pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A151J2□□H03□ | COG (EIA)      | 1000Vdc          | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A181J2□□H03□ | COG (EIA)      | 1000Vdc          | 180pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A221J2□□H03□ | COG (EIA)      | 1000Vdc          | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A271J2□□H03□ | COG (EIA)      | 1000Vdc          | 270pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A331J2□□H03□ | COG (EIA)      | 1000Vdc          | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A391J2□□H03□ | COG (EIA)      | 1000Vdc          | 390pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A471J2□□H03□ | COG (EIA)      | 1000Vdc          | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A561J2□□H03□ | COG (EIA)      | 1000Vdc          | 560pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A681J2□□H03□ | COG (EIA)      | 1000Vdc          | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A821J2□□H03□ | COG (EIA)      | 1000Vdc          | 820pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE5C3A102J2□□H03□ | COG (EIA)      | 1000Vdc          | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E101J1□□H03□ | U2J (EIA)      | 250Vdc           | 100pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E151J1□□H03□ | U2J (EIA)      | 250Vdc           | 150pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E221J1□□H03□ | U2J (EIA)      | 250Vdc           | 220pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E331J1□□H03□ | U2J (EIA)      | 250Vdc           | 330pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E471J1□□H03□ | U2J (EIA)      | 250Vdc           | 470pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E681J1□□H03□ | U2J (EIA)      | 250Vdc           | 680pF±5%    | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E102J1□□H03□ | U2J (EIA)      | 250Vdc           | 1000pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E152J1□□H03□ | U2J (EIA)      | 250Vdc           | 1500pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E222J1□□H03□ | U2J (EIA)      | 250Vdc           | 2200pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E332J1□□H03□ | U2J (EIA)      | 250Vdc           | 3300pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E472J1□□H03□ | U2J (EIA)      | 250Vdc           | 4700pF±5%   | 4.5×3.5                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E682J2□□H03□ | U2J (EIA)      | 250Vdc           | 6800pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E103J2□□H03□ | U2J (EIA)      | 250Vdc           | 10000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E153J2□□H03□ | U2J (EIA)      | 250Vdc           | 15000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E223J2□□H03□ | U2J (EIA)      | 250Vdc           | 22000pF±5%  | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2E333J3□□H03□ | U2J (EIA)      | 250Vdc           | 33000pF±5%  | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RDE7U2E473J3□□H03□ | U2J (EIA)      | 250Vdc           | 47000pF±5%  | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RDE7U2J100J2□□H03□ | U2J (EIA)      | 630Vdc           | 10pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J150J2□□H03□ | U2J (EIA)      | 630Vdc           | 15pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J220J2□□H03□ | U2J (EIA)      | 630Vdc           | 22pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J330J2□□H03□ | U2J (EIA)      | 630Vdc           | 33pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J470J2□□H03□ | U2J (EIA)      | 630Vdc           | 47pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J680J2□□H03□ | U2J (EIA)      | 630Vdc           | 68pF±5%     | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J101J2□□H03□ | U2J (EIA)      | 630Vdc           | 100pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J151J2□□H03□ | U2J (EIA)      | 630Vdc           | 150pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J221J2□□H03□ | U2J (EIA)      | 630Vdc           | 220pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J331J2□□H03□ | U2J (EIA)      | 630Vdc           | 330pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J471J2□□H03□ | U2J (EIA)      | 630Vdc           | 470pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J681J2□□H03□ | U2J (EIA)      | 630Vdc           | 680pF±5%    | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J102J2□□H03□ | U2J (EIA)      | 630Vdc           | 1000pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J152J2□□H03□ | U2J (EIA)      | 630Vdc           | 1500pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J222J2□□H03□ | U2J (EIA)      | 630Vdc           | 2200pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J332J2□□H03□ | U2J (EIA)      | 630Vdc           | 3300pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J472J2□□H03□ | U2J (EIA)      | 630Vdc           | 4700pF±5%   | 5.5×4.0                   | 3.15                   | 5.0                     | K1                         | M1                           |
| RDE7U2J682J3□□H03□ | U2J (EIA)      | 630Vdc           | 6800pF±5%   | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RDE7U2J103J3□□H03□ | U2J (EIA)      | 630Vdc           | 10000pF±5%  | 5.5×5.0                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RDE7U2J153J4□□H03□ | U2J (EIA)      | 630Vdc           | 15000pF±5%  | 7.5×5.5                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RDE7U2J223J4□□H03□ | U2J (EIA)      | 630Vdc           | 22000pF±5%  | 7.5×5.5                   | 4.0                    | 5.0                     | K1                         | M1                           |
| RDE7U2J333J5□□H03□ | U2J (EIA)      | 630Vdc           | 33000pF±5%  | 7.5×8.0                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RDE7U2J473J5□□H03□ | U2J (EIA)      | 630Vdc           | 47000pF±5%  | 7.5×8.0                   | 4.0                    | 5.0                     | B1                         | E1                           |
| RDE7U2J943JU□□H03□ | U2J (EIA)      | 630Vdc           | 94000pF±5%  | 7.7×13.0                  | 4.0                    | 5.0                     | B1                         | E1                           |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RDE7U3A100J2□□H03□ | U2J (EIA)   | 1000Vdc       | 10pF±5%     | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A150J2□□H03□ | U2J (EIA)   | 1000Vdc       | 15pF±5%     | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A220J2□□H03□ | U2J (EIA)   | 1000Vdc       | 22pF±5%     | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A330J2□□H03□ | U2J (EIA)   | 1000Vdc       | 33pF±5%     | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A470J2□□H03□ | U2J (EIA)   | 1000Vdc       | 47pF±5%     | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A680J2□□H03□ | U2J (EIA)   | 1000Vdc       | 68pF±5%     | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A101J2□□H03□ | U2J (EIA)   | 1000Vdc       | 100pF±5%    | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A151J2□□H03□ | U2J (EIA)   | 1000Vdc       | 150pF±5%    | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A221J2□□H03□ | U2J (EIA)   | 1000Vdc       | 220pF±5%    | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A331J2□□H03□ | U2J (EIA)   | 1000Vdc       | 330pF±5%    | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A471J2□□H03□ | U2J (EIA)   | 1000Vdc       | 470pF±5%    | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A681J2□□H03□ | U2J (EIA)   | 1000Vdc       | 680pF±5%    | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A102J2□□H03□ | U2J (EIA)   | 1000Vdc       | 1000pF±5%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDE7U3A152J3□□H03□ | U2J (EIA)   | 1000Vdc       | 1500pF±5%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDE7U3A222J3□□H03□ | U2J (EIA)   | 1000Vdc       | 2200pF±5%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDE7U3A332J4□□H03□ | U2J (EIA)   | 1000Vdc       | 3300pF±5%   | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDE7U3A472J4□□H03□ | U2J (EIA)   | 1000Vdc       | 4700pF±5%   | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDE7U3A682J5□□H03□ | U2J (EIA)   | 1000Vdc       | 6800pF±5%   | 7.5×8.0             | 4.0              | 5.0               | B1                   | E1                     |
| RDE7U3A103J5□□H03□ | U2J (EIA)   | 1000Vdc       | 10000pF±5%  | 7.5×8.0             | 4.0              | 5.0               | B1                   | E1                     |
| RDE7U3A203JU□□H03□ | U2J (EIA)   | 1000Vdc       | 20000pF±5%  | 7.7×13.0            | 4.0              | 5.0               | B1                   | E1                     |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## High Dielectric Constant Type, X7R/X7S Characteristics

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RDER71E104K0□□H03□ | X7R (EIA)   | 25Vdc         | 0.1μF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71E104K0□□H03□ | X7R (EIA)   | 25Vdc         | 0.1μF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDEC71E224K0□□H03□ | X7S (EIA)   | 25Vdc         | 0.22μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDEC71E224K0□□H03□ | X7S (EIA)   | 25Vdc         | 0.22μF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDEC71E474K0□□H03□ | X7S (EIA)   | 25Vdc         | 0.47μF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDEC71E474K0□□H03□ | X7S (EIA)   | 25Vdc         | 0.47μF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDEC71E105K0□□H03□ | X7S (EIA)   | 25Vdc         | 1.0μF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDEC71E105K0□□H03□ | X7S (EIA)   | 25Vdc         | 1.0μF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDEC71E225K1□□H03□ | X7S (EIA)   | 25Vdc         | 2.2μF±10%   | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDEC71E225K1□□H03□ | X7S (EIA)   | 25Vdc         | 2.2μF±10%   | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDEC71E475K2□□H03□ | X7S (EIA)   | 25Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDEC71E475K2□□H03□ | X7S (EIA)   | 25Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDEC71E106K2□□H03□ | X7S (EIA)   | 25Vdc         | 10μF±10%    | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDEC71E106K2□□H03□ | X7S (EIA)   | 25Vdc         | 10μF±10%    | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDEC71E226K3□□H03□ | X7S (EIA)   | 25Vdc         | 22μF±10%    | 5.5×5.0             | 4.0              | 2.5               | P1                   | S1                     |
| RDEC71E226K3□□H03□ | X7S (EIA)   | 25Vdc         | 22μF±10%    | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDEC71E476MW□□H03□ | X7S (EIA)   | 25Vdc         | 47μF±20%    | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER71H221K0□□H03□ | X7R (EIA)   | 50Vdc         | 220pF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H221K0□□H03□ | X7R (EIA)   | 50Vdc         | 220pF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H331K0□□H03□ | X7R (EIA)   | 50Vdc         | 330pF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H331K0□□H03□ | X7R (EIA)   | 50Vdc         | 330pF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H471K0□□H03□ | X7R (EIA)   | 50Vdc         | 470pF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H471K0□□H03□ | X7R (EIA)   | 50Vdc         | 470pF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H681K0□□H03□ | X7R (EIA)   | 50Vdc         | 680pF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H681K0□□H03□ | X7R (EIA)   | 50Vdc         | 680pF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H102K0□□H03□ | X7R (EIA)   | 50Vdc         | 1000pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H102K0□□H03□ | X7R (EIA)   | 50Vdc         | 1000pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H152K0□□H03□ | X7R (EIA)   | 50Vdc         | 1500pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H152K0□□H03□ | X7R (EIA)   | 50Vdc         | 1500pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H222K0□□H03□ | X7R (EIA)   | 50Vdc         | 2200pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RDER71H222K0□□H03□ | X7R (EIA)   | 50Vdc         | 2200pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H332K0□□H03□ | X7R (EIA)   | 50Vdc         | 3300pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H332K0□□H03□ | X7R (EIA)   | 50Vdc         | 3300pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H472K0□□H03□ | X7R (EIA)   | 50Vdc         | 4700pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H472K0□□H03□ | X7R (EIA)   | 50Vdc         | 4700pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H682K0□□H03□ | X7R (EIA)   | 50Vdc         | 6800pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H682K0□□H03□ | X7R (EIA)   | 50Vdc         | 6800pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H103K0□□H03□ | X7R (EIA)   | 50Vdc         | 10000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H103K0□□H03□ | X7R (EIA)   | 50Vdc         | 10000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H153K0□□H03□ | X7R (EIA)   | 50Vdc         | 15000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H153K0□□H03□ | X7R (EIA)   | 50Vdc         | 15000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H223K0□□H03□ | X7R (EIA)   | 50Vdc         | 22000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H223K0□□H03□ | X7R (EIA)   | 50Vdc         | 22000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H333K0□□H03□ | X7R (EIA)   | 50Vdc         | 33000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H333K0□□H03□ | X7R (EIA)   | 50Vdc         | 33000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H473K0□□H03□ | X7R (EIA)   | 50Vdc         | 47000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H473K0□□H03□ | X7R (EIA)   | 50Vdc         | 47000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H683K0□□H03□ | X7R (EIA)   | 50Vdc         | 68000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H683K0□□H03□ | X7R (EIA)   | 50Vdc         | 68000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H104K0□□H03□ | X7R (EIA)   | 50Vdc         | 0.1μF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER71H104K0□□H03□ | X7R (EIA)   | 50Vdc         | 0.1μF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER71H154K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.15μF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER71H154K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.15μF±10%  | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H224K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.22μF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER71H224K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.22μF±10%  | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H334K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.33μF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER71H334K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.33μF±10%  | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H474K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.47μF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER71H474K1□□H03□ | X7R (EIA)   | 50Vdc         | 0.47μF±10%  | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H684K2□□H03□ | X7R (EIA)   | 50Vdc         | 0.68μF±10%  | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H684K2□□H03□ | X7R (EIA)   | 50Vdc         | 0.68μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDEC71H105K1□□H03□ | X7S (EIA)   | 50Vdc         | 1.0μF±10%   | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDEC71H105K1□□H03□ | X7S (EIA)   | 50Vdc         | 1.0μF±10%   | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H105K2□□H03□ | X7R (EIA)   | 50Vdc         | 1.0μF±10%   | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H105K2□□H03□ | X7R (EIA)   | 50Vdc         | 1.0μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER71H155K2□□H03□ | X7R (EIA)   | 50Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H155K2□□H03□ | X7R (EIA)   | 50Vdc         | 1.5μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER71H225K2□□H03□ | X7R (EIA)   | 50Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDER71H225K2□□H03□ | X7R (EIA)   | 50Vdc         | 2.2μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER71H335K3□□H03□ | X7R (EIA)   | 50Vdc         | 3.3μF±10%   | 5.5×5.0             | 4.0              | 2.5               | P1                   | S1                     |
| RDER71H335K3□□H03□ | X7R (EIA)   | 50Vdc         | 3.3μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDEC71H475K2□□H03□ | X7S (EIA)   | 50Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDEC71H475K2□□H03□ | X7S (EIA)   | 50Vdc         | 4.7μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDEC71H106K3□□H03□ | X7S (EIA)   | 50Vdc         | 10μF±10%    | 5.5×5.0             | 4.0              | 2.5               | P1                   | S1                     |
| RDEC71H106K3□□H03□ | X7S (EIA)   | 50Vdc         | 10μF±10%    | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDEC71H226MW□□H03□ | X7S (EIA)   | 50Vdc         | 22μF±20%    | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72A221K0□□H03□ | X7R (EIA)   | 100Vdc        | 220pF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A221K0□□H03□ | X7R (EIA)   | 100Vdc        | 220pF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A331K0□□H03□ | X7R (EIA)   | 100Vdc        | 330pF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A331K0□□H03□ | X7R (EIA)   | 100Vdc        | 330pF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A471K0□□H03□ | X7R (EIA)   | 100Vdc        | 470pF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A471K0□□H03□ | X7R (EIA)   | 100Vdc        | 470pF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A681K0□□H03□ | X7R (EIA)   | 100Vdc        | 680pF±10%   | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A681K0□□H03□ | X7R (EIA)   | 100Vdc        | 680pF±10%   | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A102K0□□H03□ | X7R (EIA)   | 100Vdc        | 1000pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A102K0□□H03□ | X7R (EIA)   | 100Vdc        | 1000pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A152K0□□H03□ | X7R (EIA)   | 100Vdc        | 1500pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |

Continued on the following page. ➡

Continued from the preceding page. ➡

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RDER72A152K0□□H03□ | X7R (EIA)   | 100Vdc        | 1500pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A222K0□□H03□ | X7R (EIA)   | 100Vdc        | 2200pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A222K0□□H03□ | X7R (EIA)   | 100Vdc        | 2200pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A332K0□□H03□ | X7R (EIA)   | 100Vdc        | 3300pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A332K0□□H03□ | X7R (EIA)   | 100Vdc        | 3300pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A472K0□□H03□ | X7R (EIA)   | 100Vdc        | 4700pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A472K0□□H03□ | X7R (EIA)   | 100Vdc        | 4700pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A682K0□□H03□ | X7R (EIA)   | 100Vdc        | 6800pF±10%  | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A682K0□□H03□ | X7R (EIA)   | 100Vdc        | 6800pF±10%  | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A103K0□□H03□ | X7R (EIA)   | 100Vdc        | 10000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A103K0□□H03□ | X7R (EIA)   | 100Vdc        | 10000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A153K0□□H03□ | X7R (EIA)   | 100Vdc        | 15000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A153K0□□H03□ | X7R (EIA)   | 100Vdc        | 15000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A223K0□□H03□ | X7R (EIA)   | 100Vdc        | 22000pF±10% | 4.0×3.5             | 2.5              | 5.0               | K1                   | M1                     |
| RDER72A223K0□□H03□ | X7R (EIA)   | 100Vdc        | 22000pF±10% | 5.0×3.5             | 2.5              | 2.5               | P1                   | S1                     |
| RDER72A333K1□□H03□ | X7R (EIA)   | 100Vdc        | 33000pF±10% | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A333K1□□H03□ | X7R (EIA)   | 100Vdc        | 33000pF±10% | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A473K1□□H03□ | X7R (EIA)   | 100Vdc        | 47000pF±10% | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A473K1□□H03□ | X7R (EIA)   | 100Vdc        | 47000pF±10% | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A683K1□□H03□ | X7R (EIA)   | 100Vdc        | 68000pF±10% | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A683K1□□H03□ | X7R (EIA)   | 100Vdc        | 68000pF±10% | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A104K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.1μF±10%   | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A104K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.1μF±10%   | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A154K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.15μF±10%  | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A154K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.15μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A224K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.22μF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A224K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.22μF±10%  | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A334K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.33μF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A334K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.33μF±10%  | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A474K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.47μF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A474K1□□H03□ | X7R (EIA)   | 100Vdc        | 0.47μF±10%  | 5.0×3.5             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A684K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.68μF±10%  | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A684K2□□H03□ | X7R (EIA)   | 100Vdc        | 0.68μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72A105K2□□H03□ | X7R (EIA)   | 100Vdc        | 1.0μF±10%   | 5.5×4.0             | 3.15             | 2.5               | P1                   | S1                     |
| RDER72A105K2□□H03□ | X7R (EIA)   | 100Vdc        | 1.0μF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDEC72A155K3□□H03□ | X7S (EIA)   | 100Vdc        | 1.5μF±10%   | 5.5×5.0             | 4.0              | 2.5               | P1                   | S1                     |
| RDEC72A155K3□□H03□ | X7S (EIA)   | 100Vdc        | 1.5μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDEC72A225K3□□H03□ | X7S (EIA)   | 100Vdc        | 2.2μF±10%   | 5.5×5.0             | 4.0              | 2.5               | P1                   | S1                     |
| RDEC72A225K3□□H03□ | X7S (EIA)   | 100Vdc        | 2.2μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDEC72A475MW□□H03□ | X7S (EIA)   | 100Vdc        | 4.7μF±20%   | 5.5×7.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72E102K1□□H03□ | X7R (EIA)   | 250Vdc        | 1000pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E152K1□□H03□ | X7R (EIA)   | 250Vdc        | 1500pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E222K1□□H03□ | X7R (EIA)   | 250Vdc        | 2200pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E332K1□□H03□ | X7R (EIA)   | 250Vdc        | 3300pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E472K1□□H03□ | X7R (EIA)   | 250Vdc        | 4700pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E682K1□□H03□ | X7R (EIA)   | 250Vdc        | 6800pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E103K1□□H03□ | X7R (EIA)   | 250Vdc        | 10000pF±10% | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E153K1□□H03□ | X7R (EIA)   | 250Vdc        | 15000pF±10% | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E223K1□□H03□ | X7R (EIA)   | 250Vdc        | 22000pF±10% | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E333K2□□H03□ | X7R (EIA)   | 250Vdc        | 33000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E473K2□□H03□ | X7R (EIA)   | 250Vdc        | 47000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E683K2□□H03□ | X7R (EIA)   | 250Vdc        | 68000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E104K2□□H03□ | X7R (EIA)   | 250Vdc        | 0.10μF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E154K3□□H03□ | X7R (EIA)   | 250Vdc        | 0.15μF±10%  | 5.5×5.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E224K3□□H03□ | X7R (EIA)   | 250Vdc        | 0.22μF±10%  | 5.5×5.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72E334K4□□H03□ | X7R (EIA)   | 250Vdc        | 0.33μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72E474K4□□H03□ | X7R (EIA)   | 250Vdc        | 0.47μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |

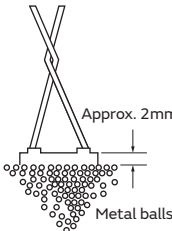
Continued on the following page. ➡

Continued from the preceding page. ↘

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RDER72E684K5□□H03□ | X7R (EIA)   | 250Vdc        | 0.68μF±10%  | 7.5×7.5             | 4.0              | 5.0               | B1                   | E1                     |
| RDER72E105K5□□H03□ | X7R (EIA)   | 250Vdc        | 1.0μF±10%   | 7.5×7.5             | 4.0              | 5.0               | B1                   | E1                     |
| RDER72E225MU□□H03□ | X7R (EIA)   | 250Vdc        | 2.2μF±20%   | 7.7×12.5            | 4.0              | 5.0               | B1                   | E1                     |
| RDER72H102K1□□H03□ | X7R (EIA)   | 500Vdc        | 1000pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H152K1□□H03□ | X7R (EIA)   | 500Vdc        | 1500pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H222K1□□H03□ | X7R (EIA)   | 500Vdc        | 2200pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H332K1□□H03□ | X7R (EIA)   | 500Vdc        | 3300pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H472K1□□H03□ | X7R (EIA)   | 500Vdc        | 4700pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H682K1□□H03□ | X7R (EIA)   | 500Vdc        | 6800pF±10%  | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H103K1□□H03□ | X7R (EIA)   | 500Vdc        | 10000pF±10% | 4.5×3.5             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H153K2□□H03□ | X7R (EIA)   | 500Vdc        | 15000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H223K2□□H03□ | X7R (EIA)   | 500Vdc        | 22000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H333K2□□H03□ | X7R (EIA)   | 500Vdc        | 33000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H473K2□□H03□ | X7R (EIA)   | 500Vdc        | 47000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72H683K3□□H03□ | X7R (EIA)   | 500Vdc        | 68000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72H104K3□□H03□ | X7R (EIA)   | 500Vdc        | 0.1μF±10%   | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72H154K4□□H03□ | X7R (EIA)   | 500Vdc        | 0.15μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72H224K4□□H03□ | X7R (EIA)   | 500Vdc        | 0.22μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72H334K5□□H03□ | X7R (EIA)   | 500Vdc        | 0.33μF±10%  | 7.5×7.5             | 4.0              | 5.0               | B1                   | E1                     |
| RDER72H474K5□□H03□ | X7R (EIA)   | 500Vdc        | 0.47μF±10%  | 7.5×7.5             | 4.0              | 5.0               | B1                   | E1                     |
| RDER72H684MU□□H03□ | X7R (EIA)   | 500Vdc        | 0.68μF±20%  | 7.7×12.5            | 4.0              | 5.0               | B1                   | E1                     |
| RDER72H105MU□□H03□ | X7R (EIA)   | 500Vdc        | 1.0μF±20%   | 7.7×12.5            | 4.0              | 5.0               | B1                   | E1                     |
| RDER72J102K2□□H03□ | X7R (EIA)   | 630Vdc        | 1000pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J152K2□□H03□ | X7R (EIA)   | 630Vdc        | 1500pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J222K2□□H03□ | X7R (EIA)   | 630Vdc        | 2200pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J332K2□□H03□ | X7R (EIA)   | 630Vdc        | 3300pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J472K2□□H03□ | X7R (EIA)   | 630Vdc        | 4700pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J682K2□□H03□ | X7R (EIA)   | 630Vdc        | 6800pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J103K2□□H03□ | X7R (EIA)   | 630Vdc        | 10000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J153K2□□H03□ | X7R (EIA)   | 630Vdc        | 15000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J223K2□□H03□ | X7R (EIA)   | 630Vdc        | 22000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER72J333K3□□H03□ | X7R (EIA)   | 630Vdc        | 33000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72J473K3□□H03□ | X7R (EIA)   | 630Vdc        | 47000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72J683K4□□H03□ | X7R (EIA)   | 630Vdc        | 68000pF±10% | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72J104K4□□H03□ | X7R (EIA)   | 630Vdc        | 0.10μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER72J154K5□□H03□ | X7R (EIA)   | 630Vdc        | 0.15μF±10%  | 7.5×8.0             | 4.0              | 5.0               | B1                   | E1                     |
| RDER72J224K5□□H03□ | X7R (EIA)   | 630Vdc        | 0.22μF±10%  | 7.5×8.0             | 4.0              | 5.0               | B1                   | E1                     |
| RDER72J474MU□□H03□ | X7R (EIA)   | 630Vdc        | 0.47μF±20%  | 7.7×13.0            | 4.0              | 5.0               | B1                   | E1                     |
| RDER73A471K2□□H03□ | X7R (EIA)   | 1000Vdc       | 470pF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A681K2□□H03□ | X7R (EIA)   | 1000Vdc       | 680pF±10%   | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A102K2□□H03□ | X7R (EIA)   | 1000Vdc       | 1000pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A152K2□□H03□ | X7R (EIA)   | 1000Vdc       | 1500pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A222K2□□H03□ | X7R (EIA)   | 1000Vdc       | 2200pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A332K2□□H03□ | X7R (EIA)   | 1000Vdc       | 3300pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A472K2□□H03□ | X7R (EIA)   | 1000Vdc       | 4700pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A682K2□□H03□ | X7R (EIA)   | 1000Vdc       | 6800pF±10%  | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A103K2□□H03□ | X7R (EIA)   | 1000Vdc       | 10000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDER73A153K3□□H03□ | X7R (EIA)   | 1000Vdc       | 15000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDER73A223K3□□H03□ | X7R (EIA)   | 1000Vdc       | 22000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDER73A333K4□□H03□ | X7R (EIA)   | 1000Vdc       | 33000pF±10% | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER73A473K4□□H03□ | X7R (EIA)   | 1000Vdc       | 47000pF±10% | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDER73A683K5□□H03□ | X7R (EIA)   | 1000Vdc       | 68000pF±10% | 7.5×8.0             | 4.0              | 5.0               | B1                   | E1                     |
| RDER73A104K5□□H03□ | X7R (EIA)   | 1000Vdc       | 0.10μF±10%  | 7.5×8.0             | 4.0              | 5.0               | B1                   | E1                     |
| RDER73A224MU□□H03□ | X7R (EIA)   | 1000Vdc       | 0.22μF±20%  | 7.7×13.0            | 4.0              | 5.0               | B1                   | E1                     |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

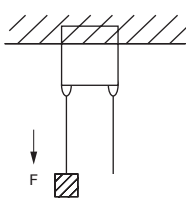
## Specifications and Test Methods

| No.                                                   | Item                                                                                                                                                                                                        |                           | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------|---------------------------|------------|---------------------------|-------------------|---------------------------|-----------|---------------------------|-------------------------------|----------------------|---------------------------|----------|---------------------------|---------------------|---------------------------|-------|---------------------------|
|                                                       |                                                                                                                                                                                                             |                           | Temperature Compensating Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | High Dielectric Constant Type                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| 1                                                     | Operating Temperature Range                                                                                                                                                                                 |                           | -55 to +125°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Char. X7R, X7S: -55 to +125°C                  | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| 2                                                     | Appearance                                                                                                                                                                                                  |                           | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| 3                                                     | Dimension and Marking                                                                                                                                                                                       |                           | See previous pages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                | Visual inspection, Vernier Caliper                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| 4                                                     | Dielectric Strength                                                                                                                                                                                         | Between Terminals         | No defects or abnormalities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                | <p>The capacitors should not be damaged when test voltages of Table are applied between the terminals for 1 to 5s. (Charge/Discharge current ≤ 50mA)</p> <table><tr><th></th><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td rowspan="4">Temperature Compensating Type</td><td>DC50V, DC100V</td><td>300% of the rated voltage</td></tr><tr><td>DC250V</td><td>200% of the rated voltage</td></tr><tr><td>DC630V</td><td>150% of the rated voltage</td></tr><tr><td>DC1kV</td><td>130% of the rated voltage</td></tr><tr><td rowspan="3">High Dielectric Constant Type</td><td>DC25V, DC50V, DC100V</td><td>250% of the rated voltage</td></tr><tr><td>DC250V</td><td>200% of the rated voltage</td></tr><tr><td>DC500V, DC630V</td><td>150% of the rated voltage</td></tr><tr><td>DC1kV</td><td>120% of the rated voltage</td></tr></table> |                                                       | Rated Voltage                                                                                                                                                                                               | Test Voltage                                                                                                                                                                                                                                              | Temperature Compensating Type | DC50V, DC100V | 300% of the rated voltage | DC250V     | 200% of the rated voltage | DC630V            | 150% of the rated voltage | DC1kV     | 130% of the rated voltage | High Dielectric Constant Type | DC25V, DC50V, DC100V | 250% of the rated voltage | DC250V   | 200% of the rated voltage | DC500V, DC630V      | 150% of the rated voltage | DC1kV | 120% of the rated voltage |
|                                                       |                                                                                                                                                                                                             |                           | Rated Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Test Voltage                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| Temperature Compensating Type                         | DC50V, DC100V                                                                                                                                                                                               | 300% of the rated voltage |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
|                                                       | DC250V                                                                                                                                                                                                      | 200% of the rated voltage |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
|                                                       | DC630V                                                                                                                                                                                                      | 150% of the rated voltage |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
|                                                       | DC1kV                                                                                                                                                                                                       | 130% of the rated voltage |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| High Dielectric Constant Type                         | DC25V, DC50V, DC100V                                                                                                                                                                                        | 250% of the rated voltage |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
|                                                       | DC250V                                                                                                                                                                                                      | 200% of the rated voltage |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
|                                                       | DC500V, DC630V                                                                                                                                                                                              | 150% of the rated voltage |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| DC1kV                                                 | 120% of the rated voltage                                                                                                                                                                                   |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| Body Insulation                                       | No defects or abnormalities                                                                                                                                                                                 |                           | <p>The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuited, is kept approximately 2mm from the balls as shown in the figure, for 1 to 5s between capacitor terminals and metal balls. (Charge/Discharge current ≤ 50mA)</p>  <table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC25V,DC50V,DC100V</td><td>250% of the rated voltage</td></tr><tr><td>DC250V, DC500V</td><td>200% of the rated voltage</td></tr><tr><td>DC630V, DC1kV</td><td>DC1300V</td></tr></table> | Rated Voltage                                  | Test Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | DC25V,DC50V,DC100V                                    | 250% of the rated voltage                                                                                                                                                                                   | DC250V, DC500V                                                                                                                                                                                                                                            | 200% of the rated voltage     | DC630V, DC1kV | DC1300V                   |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| Rated Voltage                                         | Test Voltage                                                                                                                                                                                                |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| DC25V,DC50V,DC100V                                    | 250% of the rated voltage                                                                                                                                                                                   |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| DC250V, DC500V                                        | 200% of the rated voltage                                                                                                                                                                                   |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| DC630V, DC1kV                                         | DC1300V                                                                                                                                                                                                     |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| 5                                                     | Insulation Resistance                                                                                                                                                                                       | Between Terminals         | <table><tr><th>Temperature Compensating Type</th><th>High Dielectric Constant Type</th></tr><tr><td>More than 10000M or 500MΩ • μF (Whichever is smaller)</td><td>Rated voltage:<br/>DC25V, DC50V, DC100V<br/>More than 10000M or 500MΩ • μF (Whichever is smaller)<br/>Rated voltage:<br/>DC250V, DC500V, DC630V, DC1kV<br/>More than 10000M or 100MΩ • μF (Whichever is smaller)</td></tr></table>                                                                                                                                                                                                                              | Temperature Compensating Type                  | High Dielectric Constant Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | More than 10000M or 500MΩ • μF (Whichever is smaller) | Rated voltage:<br>DC25V, DC50V, DC100V<br>More than 10000M or 500MΩ • μF (Whichever is smaller)<br>Rated voltage:<br>DC250V, DC500V, DC630V, DC1kV<br>More than 10000M or 100MΩ • μF (Whichever is smaller) | The insulation resistance should be measured with a DC voltage not exceeding the rated voltage (DC500V in case of rated vlotage: DC500V, DC630V, DC1kV) at normal temperature and humidity and within 2min of charging. (Charge/Discharge current ≤ 50mA) |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| Temperature Compensating Type                         | High Dielectric Constant Type                                                                                                                                                                               |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| More than 10000M or 500MΩ • μF (Whichever is smaller) | Rated voltage:<br>DC25V, DC50V, DC100V<br>More than 10000M or 500MΩ • μF (Whichever is smaller)<br>Rated voltage:<br>DC250V, DC500V, DC630V, DC1kV<br>More than 10000M or 100MΩ • μF (Whichever is smaller) |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| 6                                                     | Capacitance                                                                                                                                                                                                 |                           | Within the specified tolerance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                | The capacitance, Q/D.F. should be measured at 25°C at the frequency and voltage shown in the table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| 7                                                     | Q/Dissipation Factor (D.F.)                                                                                                                                                                                 |                           | 30pF min.: Q ≥ 1000<br>30pF max.: Q ≥ 400+20C<br>C: Nominal capacitance (pF)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Char. X7R: 0.025 max.<br>Char. X7S: 0.125 max. | <p>Temperature Compensating Type</p> <table><tr><th>Capacitance</th><th>Frequency</th><th>Voltage</th></tr><tr><td>C ≤ 1000pF</td><td>1±0.1MHz</td><td>AC0.5 to 5V (r.m.s.)</td></tr><tr><td>C &gt; 1000pF</td><td>1±0.1kHz</td><td>AC1±0.2V (r.m.s.)</td></tr></table> <p>High Dielectric Constant Type</p> <table><tr><th>Capacitance</th><th>Frequency</th><th>Voltage</th></tr><tr><td>C ≤ 10μF</td><td>1±0.1kHz</td><td>AC1±0.2V (r.m.s.)</td></tr><tr><td>C &gt; 10μF</td><td>120±24Hz</td><td>AC0.5±0.1V (r.m.s.)</td></tr></table>                                                                                                                                                                                                                                                                                                           | Capacitance                                           | Frequency                                                                                                                                                                                                   | Voltage                                                                                                                                                                                                                                                   | C ≤ 1000pF                    | 1±0.1MHz      | AC0.5 to 5V (r.m.s.)      | C > 1000pF | 1±0.1kHz                  | AC1±0.2V (r.m.s.) | Capacitance               | Frequency | Voltage                   | C ≤ 10μF                      | 1±0.1kHz             | AC1±0.2V (r.m.s.)         | C > 10μF | 120±24Hz                  | AC0.5±0.1V (r.m.s.) |                           |       |                           |
| Capacitance                                           | Frequency                                                                                                                                                                                                   | Voltage                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| C ≤ 1000pF                                            | 1±0.1MHz                                                                                                                                                                                                    | AC0.5 to 5V (r.m.s.)      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| C > 1000pF                                            | 1±0.1kHz                                                                                                                                                                                                    | AC1±0.2V (r.m.s.)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| Capacitance                                           | Frequency                                                                                                                                                                                                   | Voltage                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| C ≤ 10μF                                              | 1±0.1kHz                                                                                                                                                                                                    | AC1±0.2V (r.m.s.)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |
| C > 10μF                                              | 120±24Hz                                                                                                                                                                                                    | AC0.5±0.1V (r.m.s.)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                               |               |                           |            |                           |                   |                           |           |                           |                               |                      |                           |          |                           |                     |                           |       |                           |

Continued on the following page. ➤

## Specifications and Test Methods

Continued from the preceding page. ↘

| No.          | Item                                       | Specifications                                                                                                                                                                                                                                                                                                                  |                                                                              | Test Method                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|--------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|-----|---------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------|-----|--------------|-----|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|---|------|---|-------|---|------|---|-------|---|------|
|              |                                            | Temperature Compensating Type                                                                                                                                                                                                                                                                                                   | High Dielectric Constant Type                                                |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 8            | Capacitance Temperature Characteristics    | <table><tr><th>Char.</th><th>Temperature Coefficient</th></tr><tr><td rowspan="2">C0G</td><td>25 to 125°C :<br/>0±30ppm/°C</td></tr><tr><td>-55 to 25°C :<br/>0+30/-72ppm/°C</td></tr><tr><td rowspan="2">U2J</td><td>25 to 125°C :<br/>-750±120ppm/°C</td></tr><tr><td>-55 to 25°C :<br/>-750+120/-347ppm/°C</td></tr></table> | Char.                                                                        | Temperature Coefficient                                                                                                                                                                                                                                                                                                                                                                | C0G                                                                                                                                                                                                                                                                                                             | 25 to 125°C :<br>0±30ppm/°C | -55 to 25°C :<br>0+30/-72ppm/°C | U2J | 25 to 125°C :<br>-750±120ppm/°C | -55 to 25°C :<br>-750+120/-347ppm/°C | <table><tr><th>Char.</th><th>Capacitance Change</th></tr><tr><td>X7R</td><td>Within ± 15%</td></tr><tr><td>X7S</td><td>Within ± 22%</td></tr></table> | Char. | Capacitance Change | X7R | Within ± 15% | X7S | Within ± 22% | <p>The capacitance change should be measured after 5 min at each specified temperature stage. The temperature coefficient is determined using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5 (-55 to +125°C) the capacitance should be within the specified tolerance for the temperature coefficient and capacitance change.</p> <table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>125±3</td></tr><tr><td>5</td><td>25±2</td></tr></table> <p>• Pretreatment (for high dielectric constant type)<br/>Perform a heat treatment at 150+0/-10°C for 1h, and then let sit at room temperature for 24±2h.</p> | Step | Temperature (°C) | 1 | 25±2 | 2 | -55±3 | 3 | 25±2 | 4 | 125±3 | 5 | 25±2 |
| Char.        | Temperature Coefficient                    |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| C0G          | 25 to 125°C :<br>0±30ppm/°C                |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|              | -55 to 25°C :<br>0+30/-72ppm/°C            |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| U2J          | 25 to 125°C :<br>-750±120ppm/°C            |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|              | -55 to 25°C :<br>-750+120/-347ppm/°C       |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| Char.        | Capacitance Change                         |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| X7R          | Within ± 15%                               |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| X7S          | Within ± 22%                               |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| Step         | Temperature (°C)                           |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 1            | 25±2                                       |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 2            | -55±3                                      |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 3            | 25±2                                       |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 4            | 125±3                                      |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 5            | 25±2                                       |                                                                                                                                                                                                                                                                                                                                 |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 9            | Terminal Strength                          | Tensile Strength                                                                                                                                                                                                                                                                                                                | Termination not to be broken or loosened                                     | <p>As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1s.</p>                                                                                                     |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|              |                                            | Bending Strength                                                                                                                                                                                                                                                                                                                | Termination not to be broken or loosened                                     | <p>Each lead wire should be subjected to a force of 2.5N and then bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3s.</p>                                                                                                                                |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 10           | Vibration Resistance                       | Appearance                                                                                                                                                                                                                                                                                                                      | No defects or abnormalities                                                  |                                                                                                                                                                                                                                                                                                                                                                                        | <p>The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in total amplitude, with about a 1 minute rate of vibration change from 10 to 55Hz and back to 10Hz. Apply for a total of 6h, 2h each in 3 mutually perpendicular directions.</p> |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|              |                                            | Capacitance                                                                                                                                                                                                                                                                                                                     | Within the specified tolerance                                               |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|              |                                            | Q/D.F.                                                                                                                                                                                                                                                                                                                          | 30pF min.: Q ≥ 1000<br>30pF max.: Q ≥ 400+20C<br>C: Nominal capacitance (pF) | Char. X7R: 0.025 max.<br>Char. X7S: 0.125 max.                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 11           | Solderability of Leads                     | Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction.                                                                                                                                                                                                             |                                                                              | <p>The terminal of a capacitor is dipped into a 25% ethanol (JIS-K-8101) solution of rosin (JIS-K-5902) and then into molten solder for 2±0.5s. In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body.</p> <p>Temp. of solder: 245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu)<br/>235±5°C H60A or H63A Eutectic Solder</p>                                    |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
| 12<br>,<br>1 | Resistance to Soldering Heat (Non-Preheat) | The measured and observed characteristics should satisfy the specifications in the following table.                                                                                                                                                                                                                             |                                                                              | <p>The lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s.</p> <p>Pre-treatment<br/>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement. (For Char. X7R, X7S)</p> <p>Post-treatment<br/>Capacitor should be stored for 24±2h at room condition*.</p> |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|              | Appearance                                 | No defects or abnormalities                                                                                                                                                                                                                                                                                                     |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|              | Capacitance Change                         | Within ±2.5% or ±0.25pF (Whichever is larger)                                                                                                                                                                                                                                                                                   | Char. X7R: Within ±7.5%<br>Char. X7S: Within ±10%                            |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|              | Dielectric Strength (Between Terminals)    | No defects                                                                                                                                                                                                                                                                                                                      |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                 |                             |                                 |     |                                 |                                      |                                                                                                                                                       |       |                    |     |              |     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

## Specifications and Test Methods

Continued from the preceding page. ↘

| No.                                     | Item                                                                                                      | Specifications                                                                                      |                                                                                                           | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|------------|---|-------------------------|------|---|------------|--------|---|-------------------------|------|---|------------|--------|
|                                         |                                                                                                           | Temperature Compensating Type                                                                       | High Dielectric Constant Type                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| 12<br>,<br>2                            | Resistance to Soldering Heat (On-Preheat)                                                                 | The measured and observed characteristics should satisfy the specifications in the following table. |                                                                                                           | First the capacitor should be stored at 120+0/-5°C for 60+0/-5s.<br>Then, the lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement. (For Char. X7R, X7S)<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         | Appearance                                                                                                | No defects or abnormalities                                                                         |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         | Capacitance Change                                                                                        | Within ±2.5% or ±0.25pF (Whichever is larger)                                                       | Char. X7R: Within ±7.5%<br>Char. X7S: Within ±10%                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         | Dielectric Strength (Between Terminals)                                                                   | No defects                                                                                          |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| 12<br>,<br>3                            | Resistance to Soldering Heat (Soldering Iron Method)                                                      | The measured and observed characteristics should satisfy the specifications in the following table. |                                                                                                           | Test condition<br>Temperature of iron-tip: 350±10°C<br>Soldering time: 3.5±0.5s.<br>Soldering position<br>Straight Lead: 1.5 to 2.0mm from the root of terminal.<br>Crimp Lead: 1.5 to 2.0mm from the end of lead bend.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement. (For Char. X7R, X7S)<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         | Appearance                                                                                                | No defects or abnormalities                                                                         |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         | Capacitance Change                                                                                        | Within ±2.5% or ±0.25pF (Whichever is larger)                                                       | Char. X7R: Within ±7.5%<br>Char. X7S: Within ±10%                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         | Dielectric Strength (Between Terminals)                                                                   | No defects                                                                                          |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| 13                                      | Temperature Cycle                                                                                         | Appearance                                                                                          | No defects or abnormalities                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | The capacitor should be subjected to 5 temperature cycles.<br>Set for 24±2h at room temperature, then measure. <table><tr><th>Step</th><th>Temperature (°C)</th><th>Time (min)</th></tr><tr><td>1</td><td>Min. Operating Temp. ±3</td><td>30±3</td></tr><tr><td>2</td><td>Room Temp.</td><td>3 max.</td></tr><tr><td>3</td><td>Max. Operating Temp. ±3</td><td>30±3</td></tr><tr><td>4</td><td>Room Temp.</td><td>3 max.</td></tr></table><br>• Pretreatment (for high dielectric constant type)<br>Perform a heat treatment at 150+0/-10°C for 1h, and then let sit at room temperature for 24±2h. | Step | Temperature (°C) | Time (min) | 1 | Min. Operating Temp. ±3 | 30±3 | 2 | Room Temp. | 3 max. | 3 | Max. Operating Temp. ±3 | 30±3 | 4 | Room Temp. | 3 max. |
|                                         |                                                                                                           | Step                                                                                                | Temperature (°C)                                                                                          | Time (min)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | 1                                                                                                   | Min. Operating Temp. ±3                                                                                   | 30±3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | 2                                                                                                   | Room Temp.                                                                                                | 3 max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | 3                                                                                                   | Max. Operating Temp. ±3                                                                                   | 30±3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| 4                                       | Room Temp.                                                                                                | 3 max.                                                                                              |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| Capacitance Change                      | Within ±5% or ±0.5pF (whichever is larger)                                                                | Char. X7R, X7S: Within ±12.5%                                                                       |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| Q/D.F.                                  | 30pF min.: Q ≥ 350<br>10pF to 30pF: Q ≥ 275+5C/2<br>10pF max.: Q ≥ 200+10C<br>C: Nominal capacitance (pF) | Char. X7R: 0.05 max.<br>Char. X7S: 0.2 max.                                                         |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| Insulation Resistance                   | 1000MΩ, 50MΩ • μF min. (whichever is smaller)                                                             |                                                                                                     |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| Dielectric Strength (Between Terminals) | No defects or abnormalities                                                                               |                                                                                                     |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| 14                                      | Humidity (Steady State)                                                                                   | Appearance                                                                                          | No defects or abnormalities                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Set the capacitor at 40±2°C and relative humidity of 90 to 95% for 500 <sup>+24</sup> <sub>0</sub> h.<br>Remove and set for 24±2h at room temperature, then measure.<br>• Pretreatment (for high dielectric constant type)<br>Perform a heat treatment at 150+0/-10°C for 1h, and then let sit at room temperature for 24±2h.                                                                                                                                                                                                                                                                       |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | Capacitance Change                                                                                  | Within ±5% or ±0.5pF (whichever is larger)                                                                | Char. X7R, X7S: Within ±12.5%                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | Q/D.F.                                                                                              | 30pF min.: Q ≥ 350<br>10pF to 30pF: Q ≥ 275+5C/2<br>10pF max.: Q ≥ 200+10C<br>C: Nominal capacitance (pF) | Char. X7R: 0.05 max.<br>Char. X7S: 0.2 max.                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | Insulation Resistance                                                                               | 1000MΩ, 50MΩ • μF min. (whichever is smaller)                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
| 15                                      | Humidity Load                                                                                             | Appearance                                                                                          | No defects or abnormalities                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Apply the rated voltage for 500 <sup>+24</sup> <sub>0</sub> h at 40±2°C and in 90 to 95% humidity.<br>Remove and set for 24±2h at room temperature, then measure.<br>(Charge/Discharge current ≤ 50mA)<br>• Pretreatment (for high dielectric constant type)<br>Perform a heat treatment at 150+0/-10°C for 1h, and then let sit at room temperature for 24±2h.                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | Capacitance Change                                                                                  | Within ±5% or ±0.5pF (whichever is larger)                                                                | Char. X7R, X7S: Within ±12.5%                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | Q/D.F.                                                                                              | 30pF min.: Q ≥ 200<br>30pF max.: Q ≥ 100+10C/3<br>C: Nominal capacitance (pF)                             | Char. X7R: 0.05 max.<br>Char. X7S: 0.2 max.                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |
|                                         |                                                                                                           | Insulation Resistance                                                                               | 500MΩ or 25MΩ • μF min. (whichever is smaller)                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |            |   |                         |      |   |            |        |   |                         |      |   |            |        |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

## Specifications and Test Methods

Continued from the preceding page. ↘

| No.                   | Item                                                                                                      |                                             | Specifications                |                               | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
|-----------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------|--------------|-------------------------------|-----------------------|---------------------------|---------------|---------------------------|-------------------------------|------------------------------|---------------------------|----------------|---------------------------|-------|---------------------------|
|                       |                                                                                                           |                                             | Temperature Compensating Type | High Dielectric Constant Type |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
| 16                    | High Temperature Load                                                                                     | Appearance                                  | No defects or abnormalities   |                               | <div>Apply voltage in Table for 1000±48h at the maximum operating temperature±3°C. Remove and set for 24±2h at room temperature, then measure. (Charge/Discharge current ≤ 50mA)</div> <table><tr><th></th><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td rowspan="2">Temperature Compensating Type</td><td>DC50V, DC100V, DC250V</td><td>150% of the rated voltage</td></tr><tr><td>DC630V, DC1kV</td><td>120% of the rated voltage</td></tr><tr><td rowspan="3">High Dielectric Constant Type</td><td>DC25V, DC50V, DC100V, DC250V</td><td>150% of the rated voltage</td></tr><tr><td>DC500V, DC630V</td><td>120% of the rated voltage</td></tr><tr><td>DC1kV</td><td>110% of the rated voltage</td></tr></table> <div>• Pretreatment (for high dielectric constant type)<br/>Appy test voltage for 1h at test temperature. Remove and set for 24±2h at room temperature.</div> |  | Rated Voltage | Test Voltage | Temperature Compensating Type | DC50V, DC100V, DC250V | 150% of the rated voltage | DC630V, DC1kV | 120% of the rated voltage | High Dielectric Constant Type | DC25V, DC50V, DC100V, DC250V | 150% of the rated voltage | DC500V, DC630V | 120% of the rated voltage | DC1kV | 110% of the rated voltage |
|                       |                                                                                                           |                                             | Rated Voltage                 | Test Voltage                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
|                       |                                                                                                           | Temperature Compensating Type               | DC50V, DC100V, DC250V         | 150% of the rated voltage     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
|                       |                                                                                                           |                                             | DC630V, DC1kV                 | 120% of the rated voltage     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
|                       |                                                                                                           | High Dielectric Constant Type               | DC25V, DC50V, DC100V, DC250V  | 150% of the rated voltage     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
| DC500V, DC630V        | 120% of the rated voltage                                                                                 |                                             |                               |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
| DC1kV                 | 110% of the rated voltage                                                                                 |                                             |                               |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
| Capacitance Change    | Within ±3% or ±0.3pF (whichever is larger)                                                                | Char. X7R, X7S: Within ±12.5%               |                               |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
| Q/D.F.                | 30pF min.: Q ≥ 350<br>10pF to 30pF: Q ≥ 275+5C/2<br>10pF max.: Q ≥ 200+10C<br>C: Nominal capacitance (pF) | Char. X7R: 0.04 max.<br>Char. X7S: 0.2 max. |                               |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
| Insulation Resistance | 1000MΩ, 50MΩ • μF min. (whichever is smaller)                                                             |                                             |                               |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
| 17                    | Solvent Resistance                                                                                        | Appearance                                  | No defects or abnormalities   |                               | <div>The capacitor should be fully immersed, unagitated, in reagent at 20 to 25°C for 30±5s and then removed gently. Marking on the surface of the capacitor should immediately be visually examined.</div> <div>Reagent:</div> <div>• Isopropyl alcohol</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |
|                       |                                                                                                           | Marking                                     | Legible                       |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |               |              |                               |                       |                           |               |                           |                               |                              |                           |                |                           |       |                           |

Apply voltage in Table for  $1000 \pm 48\text{h}$  at the maximum operating temperature  $\pm 3^\circ\text{C}$ . Remove and set for  $24 \pm 2\text{h}$  at room temperature, then measure. (Charge/Discharge current  $\leq 50\text{mA}$ )

|                               | Rated Voltage                | Test Voltage              |
|-------------------------------|------------------------------|---------------------------|
| Temperature Compensating Type | DC50V, DC100V, DC250V        | 150% of the rated voltage |
|                               | DC630V, DC1kV                | 120% of the rated voltage |
| High Dielectric Constant Type | DC25V, DC50V, DC100V, DC250V | 150% of the rated voltage |
|                               | DC500V, DC630V               | 120% of the rated voltage |
|                               | DC1kV                        | 110% of the rated voltage |

• Pretreatment (for high dielectric constant type)  
Apply test voltage for 1h at test temperature. Remove and set for  $24 \pm 2\text{h}$  at room temperature.

The capacitor should be fully immersed, unagitated, in reagent at  $20$  to  $25^\circ\text{C}$  for  $30 \pm 5\text{s}$  and then removed gently. Marking on the surface of the capacitor should immediately be visually examined.

Reagent:  
• Isopropyl alcohol

# Leaded MLCC for General Purpose

## RDE Series Large Capacitance and High Allowable Ripple Current (DC250V-DC630V)

### Features

1. Higher capacitance with DC-Bias; approximately 40% higher than X7R under loaded rated voltage.
2. Meet LF (Lead Free) and HF (Halogen Free)
3. Allowable higher ripple current
4. Reduces acoustic noise  
Approximately 15dB reduction in comparison to leaded X7R characteristics parts.  
Approximately 30dB reduction in comparison to SMD X7R characteristics part because the contact area is smaller than a SMD.

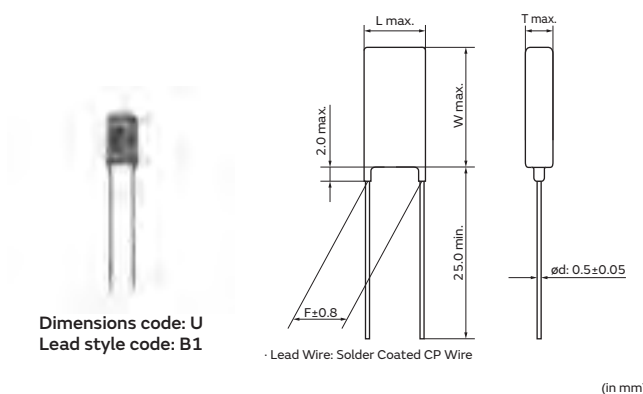
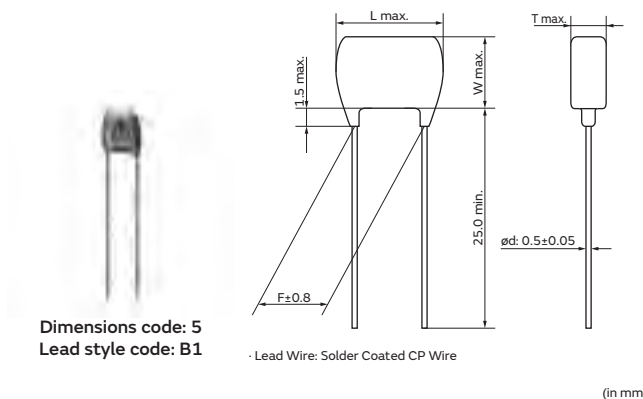
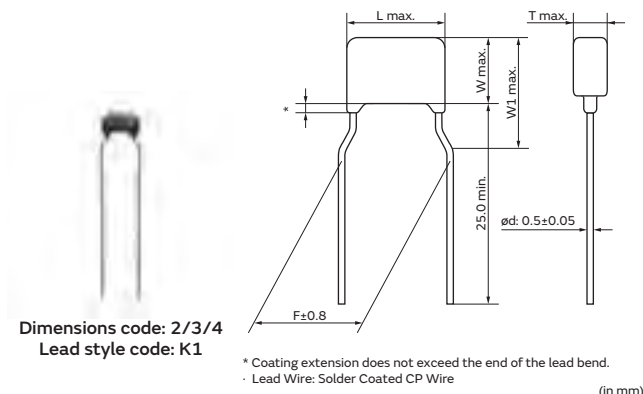
### Applications

1. DC smoothing capacitor for LED bulb
2. PFC capacitor for general use SMPS
3. Replace Al-E capacitor for long-life equipment

### Dimensions

| Dimensions and Lead Style Code | DC Rated Voltage | Dimensions (mm) |       |     |                                          |     |     |
|--------------------------------|------------------|-----------------|-------|-----|------------------------------------------|-----|-----|
|                                |                  | L               | W     | W1  | T                                        | F   | d   |
| <b>2K1/2M1</b>                 | 250V/450V/630V   | 5.5             | 4.0   | 6.0 | See the individual product specification | 5.0 | 0.5 |
| <b>3K1/3M1</b>                 | 250V/450V/630V   | 5.5             | 5.0   | 7.5 |                                          | 5.0 | 0.5 |
| <b>4K1/4M1</b>                 | 250V/450V/630V   | 7.5             | 5.5   | 8.0 |                                          | 5.0 | 0.5 |
| <b>5B1/5E1</b>                 | 250V/450V/630V   | 7.5             | 7.5*  | -   |                                          | 5.0 | 0.5 |
| <b>UB1/UE1</b>                 | 250V/450V/630V   | 7.7             | 12.5* | -   |                                          | 5.0 | 0.5 |

\*DC630V: W+0.5mm



## Marking

| Dimensions Code               | Rated Voltage | DC250V                                             | DC450V | DC630V |
|-------------------------------|---------------|----------------------------------------------------|--------|--------|
|                               | Temp. Char.   | X7T                                                |        |        |
| 2                             |               |                                                    |        |        |
| 3, 8                          |               |                                                    |        |        |
| 5, U                          |               |                                                    |        |        |
| Temperature Characteristics   |               | Marked with code (X7T char.: 7)                    |        |        |
| Nominal Capacitance           |               | Marked with 3 figures                              |        |        |
| Capacitance Tolerance         |               | Marked with code                                   |        |        |
| Rated Voltage                 |               | Marked with code (DC250V: 4, DC450V: 9, DC630V: 7) |        |        |
| Manufacturer's Identification |               | Marked with                                        |        |        |

## High Dielectric Constant Type, X7T Characteristics

| Part Number        | Temp. Char. | Rated Voltage | Capacitance | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping |
|--------------------|-------------|---------------|-------------|---------------------|------------------|-------------------|----------------------|------------------------|
| RDED72E333K2□□H03□ | X7T (EIA)   | 250Vdc        | 33000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72E473K2□□H03□ | X7T (EIA)   | 250Vdc        | 47000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72E683K2□□H03□ | X7T (EIA)   | 250Vdc        | 68000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72E104K3□□H03□ | X7T (EIA)   | 250Vdc        | 0.10μF±10%  | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72E154K3□□H03□ | X7T (EIA)   | 250Vdc        | 0.15μF±10%  | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72E224K4□□H03□ | X7T (EIA)   | 250Vdc        | 0.22μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72E334K4□□H03□ | X7T (EIA)   | 250Vdc        | 0.33μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72E474K5□□H03□ | X7T (EIA)   | 250Vdc        | 0.47μF±10%  | 7.5×7.5             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72E684K5□□H03□ | X7T (EIA)   | 250Vdc        | 0.68μF±10%  | 7.5×7.5             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72E105K5□□H03□ | X7T (EIA)   | 250Vdc        | 1.0μF±10%   | 7.5×7.5             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72E225MU□□H03□ | X7T (EIA)   | 250Vdc        | 2.2μF±20%   | 7.7×12.5            | 4.5              | 5.0               | B1                   | E1                     |
| RDED72W103K2□□H03□ | X7T (EIA)   | 450Vdc        | 10000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72W153K2□□H03□ | X7T (EIA)   | 450Vdc        | 15000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72W223K2□□H03□ | X7T (EIA)   | 450Vdc        | 22000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72W333K2□□H03□ | X7T (EIA)   | 450Vdc        | 33000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72W473K2□□H03□ | X7T (EIA)   | 450Vdc        | 47000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72W683K3□□H03□ | X7T (EIA)   | 450Vdc        | 68000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72W104K3□□H03□ | X7T (EIA)   | 450Vdc        | 0.10μF±10%  | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72W154K4□□H03□ | X7T (EIA)   | 450Vdc        | 0.15μF±10%  | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72W224K5□□H03□ | X7T (EIA)   | 450Vdc        | 0.22μF±10%  | 7.5×7.5             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72W334K5□□H03□ | X7T (EIA)   | 450Vdc        | 0.33μF±10%  | 7.5×7.5             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72W474K5□□H03□ | X7T (EIA)   | 450Vdc        | 0.47μF±10%  | 7.5×7.5             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72W564K5□□H03□ | X7T (EIA)   | 450Vdc        | 0.56μF±10%  | 7.5×7.5             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72W105MU□□H03□ | X7T (EIA)   | 450Vdc        | 1.0μF±20%   | 7.7×12.5            | 4.5              | 5.0               | B1                   | E1                     |
| RDED72W125MU□□H03□ | X7T (EIA)   | 450Vdc        | 1.2μF±20%   | 7.7×12.5            | 4.5              | 5.0               | B1                   | E1                     |
| RDED72J103K2□□H03□ | X7T (EIA)   | 630Vdc        | 10000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72J153K2□□H03□ | X7T (EIA)   | 630Vdc        | 15000pF±10% | 5.5×4.0             | 3.15             | 5.0               | K1                   | M1                     |
| RDED72J223K3□□H03□ | X7T (EIA)   | 630Vdc        | 22000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72J333K3□□H03□ | X7T (EIA)   | 630Vdc        | 33000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72J473K3□□H03□ | X7T (EIA)   | 630Vdc        | 47000pF±10% | 5.5×5.0             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72J683K4□□H03□ | X7T (EIA)   | 630Vdc        | 68000pF±10% | 7.5×5.5             | 4.0              | 5.0               | K1                   | M1                     |
| RDED72J104K5□□H03□ | X7T (EIA)   | 630Vdc        | 0.10μF±10%  | 7.5×8.0             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72J154K5□□H03□ | X7T (EIA)   | 630Vdc        | 0.15μF±10%  | 7.5×8.0             | 4.5              | 5.0               | B1                   | E1                     |
| RDED72J224K5□□H03□ | X7T (EIA)   | 630Vdc        | 0.22μF±10%  | 7.5×8.0             | 4.5              | 5.0               | B1                   | E1                     |

Continued on the following page. ➤

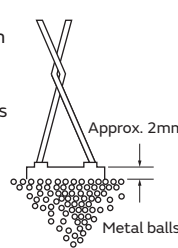
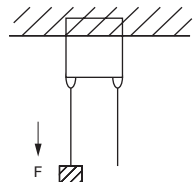
Continued from the preceding page. ↘

| Part Number                         | Temp.<br>Char. | Rated<br>Voltage | Capacitance | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead Space<br>F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping |
|-------------------------------------|----------------|------------------|-------------|---------------------------|------------------------|-------------------------|----------------------------|------------------------------|
| <b>RDED72J274K5</b> □□ <b>H03</b> □ | X7T (EIA)      | 630Vdc           | 0.27μF±10%  | 7.5×8.0                   | 4.5                    | 5.0                     | B1                         | E1                           |
| <b>RDED72J474MU</b> □□ <b>H03</b> □ | X7T (EIA)      | 630Vdc           | 0.47μF±20%  | 7.7×13.0                  | 4.5                    | 5.0                     | B1                         | E1                           |
| <b>RDED72J564MU</b> □□ <b>H03</b> □ | X7T (EIA)      | 630Vdc           | 0.56μF±20%  | 7.7×13.0                  | 4.5                    | 5.0                     | B1                         | E1                           |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.

The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## Specifications and Test Methods

| No.    | Item                                    |                   | Specifications                                        | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
|--------|-----------------------------------------|-------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------|--------|---------------------------|--------|---------------------------|--------|---------------------------|---|-------|---|------|
| 1      | Operating Temperature Range             |                   | -55 to +125°C                                         | —                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 2      | Appearance                              |                   | No defects or abnormalities                           | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 3      | Dimension and Marking                   |                   | See previous pages                                    | Visual inspection, Vernier Caliper                                                                                                                                                                                                                                                                                                                                                                                                        |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 4      | Dielectric Strength                     | Between Terminals | No defects or abnormalities                           | <p>The capacitor should not be damaged when voltage in Table is applied between the terminations for 1 to 5s.<br/>(Charge/Discharge current <math>\leq 50\text{mA}</math>)</p> <table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC250V</td><td>200% of the rated voltage</td></tr><tr><td>DC450V</td><td>150% of the rated voltage</td></tr><tr><td>DC630V</td><td>120% of the rated voltage</td></tr></table>          | Rated Voltage | Test Voltage     | DC250V | 200% of the rated voltage | DC450V | 150% of the rated voltage | DC630V | 120% of the rated voltage |   |       |   |      |
|        |                                         | Rated Voltage     | Test Voltage                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| DC250V | 200% of the rated voltage               |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| DC450V | 150% of the rated voltage               |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| DC630V | 120% of the rated voltage               |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
|        |                                         | Body Insulation   | No defects or abnormalities                           | <p>The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuit, is kept approximately 2mm from the balls as shown in the figure, and 200% of the rated DC voltage is impressed for 1 to 5s between capacitor terminals and metal balls. (Charge/Discharge current <math>\leq 50\text{mA}</math>)</p>  |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 5      | Insulation Resistance                   | Between Terminals | More than 10000MΩ or 100MΩ · μF, Whichever is smaller | The insulation resistance should be measured with DC500V (DC250V in case of rated voltage: DC250V,DC450V) at normal temperature and humidity and within 2min of charging. (Charge/Discharge current $\leq 50\text{mA}$ )                                                                                                                                                                                                                  |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 6      | Capacitance                             |                   | Within the specified tolerance                        | The capacitance/D.F. should be measured at the frequency of 1±0.1kHz and a voltage of AC1±0.2V(r.m.s.).                                                                                                                                                                                                                                                                                                                                   |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 7      | Dissipation Factor (D.F.)               |                   | 0.01 max.                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 8      | Capacitance Temperature Characteristics |                   | Within +22/-33%                                       | <p>The capacitance change should be measured after 5min at each specified temperature stage.</p> <table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>125±3</td></tr><tr><td>5</td><td>25±2</td></tr></table>                                                                                                         | Step          | Temperature (°C) | 1      | 25±2                      | 2      | -55±3                     | 3      | 25±2                      | 4 | 125±3 | 5 | 25±2 |
| Step   | Temperature (°C)                        |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 1      | 25±2                                    |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 2      | -55±3                                   |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 3      | 25±2                                    |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 4      | 125±3                                   |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 5      | 25±2                                    |                   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 9      | Terminal Strength                       | Tensile Strength  | Termination not to be broken or loosened              | <p>As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1s.</p>                                                                                                                                                       |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
|        |                                         | Bending Strength  | Termination not to be broken or loosened              | Each lead wire should be subjected to a force of 2.5N and then bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3s.                                                                                                                                                                                          |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
| 10     | Vibration Resistance                    | Appearance        | No defects or abnormalities                           | The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in total amplitude, with about a 1 minute rate of vibration change from 10 to 55Hz and back to 10Hz. Apply for a total of 6h, 2h each in 3 mutually perpendicular directions.                                                                                                                                  |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
|        |                                         | Capacitance       | Within the specified tolerance                        |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |
|        |                                         | D.F.              | 0.01 max.                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |        |                           |        |                           |        |                           |   |       |   |      |

Continued on the following page. ➤

## Specifications and Test Methods

Continued from the preceding page. ↘

| No.                                     | Item                                                 | Specifications                                                                                                      |                                                      | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|-----------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|------------|---|-------|------|---|------------|--------|---|-------|------|---|------------|--------|
| 11                                      | Solderability of Leads                               | Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction. |                                                      | The terminal of a capacitor is dipped into a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion) and then into molten solder (JIS-Z-3282) for 2±0.5s. In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body.<br>Temp. of solder: 245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu)<br>235±5°C H60A or H63A Eutectic Solder                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 12<br>,<br>1                            | Resistance to Soldering Heat (Non-Preheat)           | The measured and observed characteristics should satisfy the specifications in the following table.                 |                                                      | The lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement.<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                                                                                                                        |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Appearance                                                                                                          | No defects or abnormalities                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Capacitance Change                                                                                                  | Within ±10%                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Dielectric Strength (Between Terminals)                                                                             | No defects                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 12<br>,<br>2                            | Resistance to Soldering Heat (On-Preheat)            | The measured and observed characteristics should satisfy the specifications in the following table.                 |                                                      | First the capacitor should be stored at 120+0/-5°C for 60+0/-5s.<br>Then, the lead wires should be immersed in the melted solder 1.5 to 2.0mm from the root of terminal at 260±5°C for 7.5+0/-1s.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement.<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                                              |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Appearance                                                                                                          | No defects or abnormalities                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Capacitance Change                                                                                                  | Within ±10%                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Dielectric Strength (Between Terminals)                                                                             | No defects                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 12<br>,<br>3                            | Resistance to Soldering Heat (Soldering Iron Method) | The measured and observed characteristics should satisfy the specifications in the following table.                 |                                                      | Test condition<br>Temperature of iron-tip: 350±10°C<br>Soldering time: 3.5±0.5s.<br>Soldering position<br>Straight Lead: 1.5 to 2.0mm from the root of terminal.<br>Crimp Lead: 1.5 to 2.0mm from the end of lead bend.<br>Pre-treatment<br>Capacitor should be stored at 150+0/-10°C for 1h, then place at room temperature for 24±2h before initial measurement.<br>Post-treatment<br>Capacitor should be stored for 24±2h at room condition*.                        |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Appearance                                                                                                          | No defects or abnormalities                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Capacitance Change                                                                                                  | Within ±10%                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Dielectric Strength (Between Terminals)                                                                             | No defects                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 13                                      | Temperature Cycle                                    | Appearance                                                                                                          | No defects or abnormalities                          | The capacitor should be subjected to 5 temperature cycles. <table><tr><th>Step</th><th>Temperature (°C)</th><th>Time (min)</th></tr><tr><td>1</td><td>-55±3</td><td>30±3</td></tr><tr><td>2</td><td>Room Temp.</td><td>3 max.</td></tr><tr><td>3</td><td>125±3</td><td>30±3</td></tr><tr><td>4</td><td>Room Temp.</td><td>3 max.</td></tr></table><br>• Pretreatment<br>Perform a heat treatment at 150+0/-10°C for 1h, and then let sit at room temperature for 24±2h. | Step       | Temperature (°C) | Time (min) | 1 | -55±3 | 30±3 | 2 | Room Temp. | 3 max. | 3 | 125±3 | 30±3 | 4 | Room Temp. | 3 max. |
|                                         |                                                      | Step                                                                                                                | Temperature (°C)                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Time (min) |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | 1                                                                                                                   | -55±3                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 30±3       |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | 2                                                                                                                   | Room Temp.                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3 max.     |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | 3                                                                                                                   | 125±3                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 30±3       |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | 4                                                                                                                   | Room Temp.                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3 max.     |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| Capacitance Change                      | Within ±12.5%                                        |                                                                                                                     |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| D.F.                                    | 0.01 max.                                            |                                                                                                                     |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| Insulation Resistance                   | More than 1000MΩ or 50MΩ • μF (Whichever is smaller) |                                                                                                                     |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| Dielectric Strength (Between Terminals) | No defects or abnormalities                          |                                                                                                                     |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 14                                      | Humidity (Steady State)                              | Appearance                                                                                                          | No defects or abnormalities                          | Set the capacitor at 40±2°C and relative humidity of 90 to 95% for 500±2 <sup>4</sup> h. Remove and set for 24±2h at room temperature, then measure.<br><br>• Pretreatment<br>Perform a heat treatment at 150+0/-10°C for 1h and then let sit at room temperature for 24±2h.                                                                                                                                                                                            |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Capacitance Change                                                                                                  | Within ±12.5%                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | D.F.                                                                                                                | 0.02 max.                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Insulation Resistance                                                                                               | More than 1000MΩ or 50MΩ • μF (Whichever is smaller) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 15                                      | Humidity Load                                        | Appearance                                                                                                          | No defects or abnormalities                          | Apply the rated voltage at 40±2°C and relative humidity of 90 to 95% for 500±2 <sup>4</sup> h. Remove and set for 24±2h at room temperature, then measure.<br>(Charge/Discharge current ≤ 50mA)<br><br>• Pretreatment<br>Perform a heat treatment at 150+0/-10°C for 1h and then let sit at room temperature for 24±2h.                                                                                                                                                 |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Capacitance Change                                                                                                  | Within ±12.5%                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | D.F.                                                                                                                | 0.02 max.                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                                                      | Insulation Resistance                                                                                               | More than 500MΩ or 25MΩ • μF (Whichever is smaller)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |

\* "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmosphere pressure: 86 to 106kPa

Continued on the following page. ↗

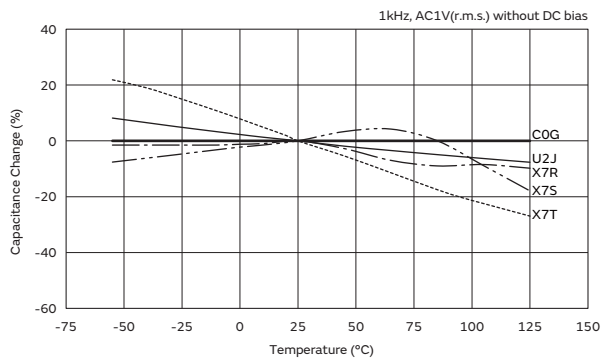
## Specifications and Test Methods

Continued from the preceding page. ↘

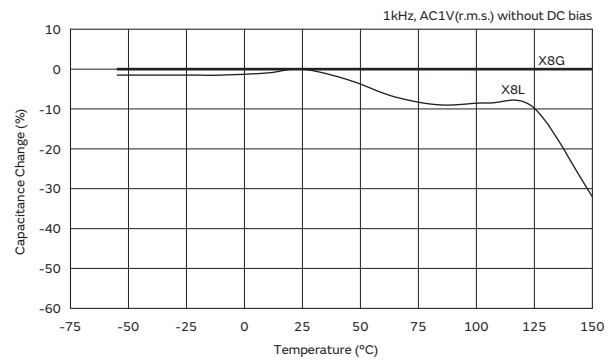
| No.                   | Item                                                 |               | Specifications              | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |              |        |                           |        |                           |        |                           |
|-----------------------|------------------------------------------------------|---------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------|--------|---------------------------|--------|---------------------------|--------|---------------------------|
| 16                    | High Temperature Load                                | Appearance    | No defects or abnormalities | <div>Apply voltage in Table for <math>1000 \pm 48</math>h at the maximum operating temperature. Remove and set for <math>24 \pm 2</math>h at room temperature, then measure.<br/>(Charge/Discharge current <math>\leq 50</math>mA)</div> <table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC250V</td><td>150% of the rated voltage</td></tr><tr><td>DC450V</td><td>130% of the rated voltage</td></tr><tr><td>DC630V</td><td>120% of the rated voltage</td></tr></table> <div>• Pretreatment<br/>Apply test voltage for 1h, at test temperature. Remove and set for <math>24 \pm 2</math>h at room temperature.</div> | Rated Voltage | Test Voltage | DC250V | 150% of the rated voltage | DC450V | 130% of the rated voltage | DC630V | 120% of the rated voltage |
|                       |                                                      | Rated Voltage | Test Voltage                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |        |                           |        |                           |        |                           |
|                       |                                                      | DC250V        | 150% of the rated voltage   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |        |                           |        |                           |        |                           |
|                       |                                                      | DC450V        | 130% of the rated voltage   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |        |                           |        |                           |        |                           |
| DC630V                | 120% of the rated voltage                            |               |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |        |                           |        |                           |        |                           |
| Capacitance Change    | Within $\pm 12.5\%$                                  |               |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |        |                           |        |                           |        |                           |
| D.F.                  | 0.02 max.                                            |               |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |        |                           |        |                           |        |                           |
| Insulation Resistance | More than 1000MΩ or 50MΩ · μF (Whichever is smaller) |               |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |        |                           |        |                           |        |                           |
| 17                    | Solvent Resistance                                   | Appearance    | No defects or abnormalities | <div>The capacitor should be fully immersed, unagitated, in reagent at 20 to 25°C for <math>30 \pm 5</math>s and then removed gently. Marking on the surface of the capacitor should immediately be visually examined.<br/>Reagent :<br/>• Isopropyl alcohol</div>                                                                                                                                                                                                                                                                                                                                                                      |               |              |        |                           |        |                           |        |                           |
|                       |                                                      | Marking       | Legible                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |              |        |                           |        |                           |        |                           |

### Characteristics Reference Data (Typical Example)

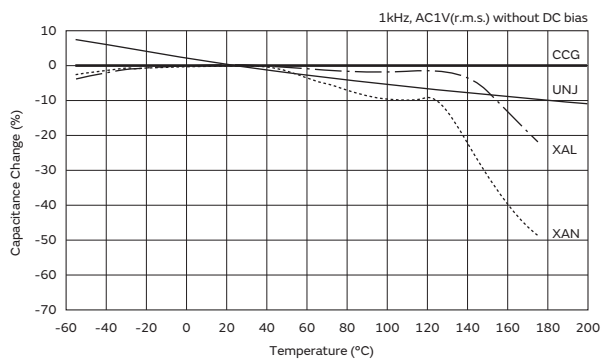
### Capacitance - Temperature Characteristics (RCE, RDE Series)



### Capacitance - Temperature Characteristics (RHE Series)

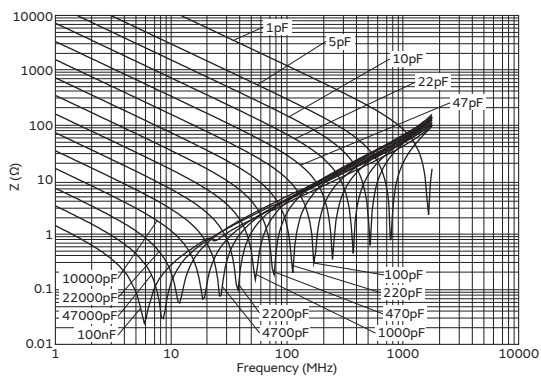


### Capacitance - Temperature Characteristics (RHS Series)

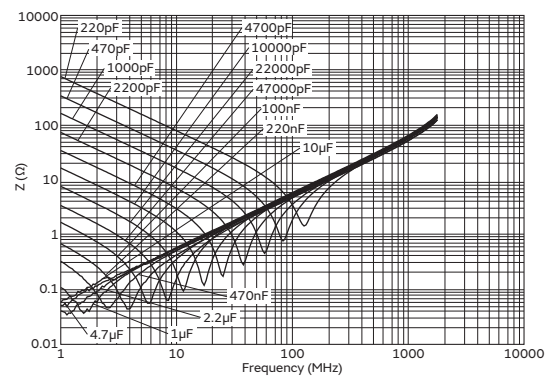


## Impedance - Frequency Characteristics

### Temperature Compensating Type

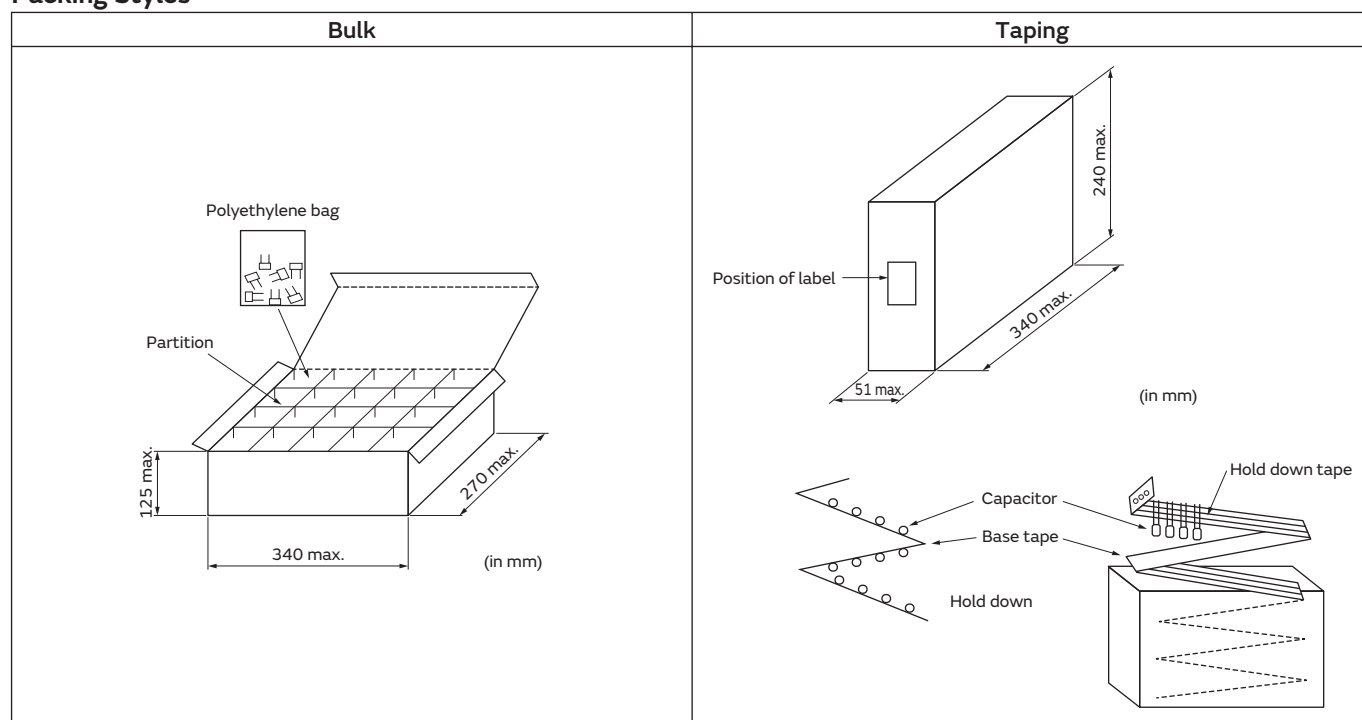


### High Dielectric Constant Type



## Packaging

### Packing Styles



### Minimum Quantity

#### [Bulk]

| Series | Dimensions Code | Minimum Quantity (pcs./Bag)* |
|--------|-----------------|------------------------------|
| RCE    | Except for "U"  | 500                          |
|        | U               | 200                          |
| RHE    | 0, 1, 2, 3, W   | 500                          |
| RHS    | 0, 1, 2         | 500                          |
| RDE    | Except for "U"  | 500                          |
|        | U               | 200                          |

#### [Taping]

| Series | Dimensions Code | Minimum Quantity (pcs./Ammo Pack)* |
|--------|-----------------|------------------------------------|
| RCE    | 0, 1, 2         | 2000                               |
|        | 3               | 2000 or 1500                       |
|        | 4, 5, U, W      | 1500                               |
| RHE    | 0, 1, 2         | 2000                               |
|        | 3, W            | 1500                               |
| RHS    | 0, 1            | 2000                               |
|        | 2               | 1500                               |
| RDE    | 0, 1, 2         | 2000                               |
|        | 3               | 2000 or 1500                       |
|        | 4, 5, W         | 1500                               |
|        | U               | 1500 or 1000                       |

Please order with an integral multiple of the minimum quantity above.

\*Minimum Quantity may change depends on part number.

Please check our website "Product details".

"Minimum Quantity" means the numbers of units of each delivery or order. The quantity should be an integral multiple of the "minimum quantity." (Please note that the actual delivery quantity in a package may change sometimes.)

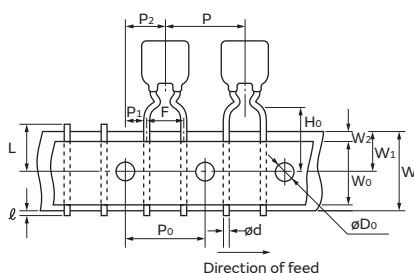
Continued on the following page. ↗

## Packaging

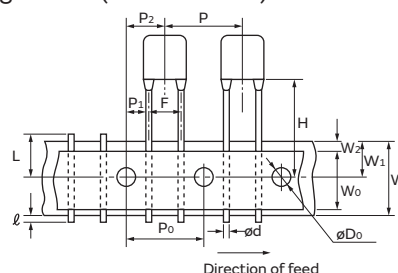
Continued from the preceding page. ➤

### Taping Dimensions

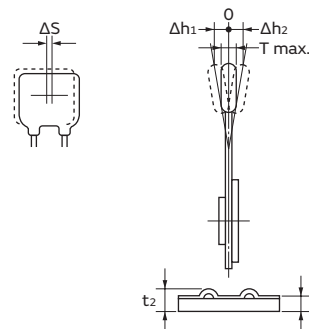
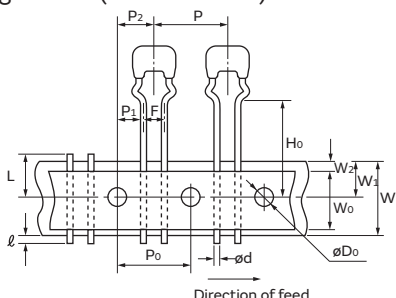
#### Inside Crimp Taping Lead Spacing 5.0mm (Lead Code: M1, M2)



#### Straight Taping Lead Spacing 2.5mm (Lead Code: DB, DG) Lead Spacing 5.0mm (Lead Code: E1)



#### Outside Crimp Taping Lead Spacing 2.5mm (Lead Code: S1)



#### Dimension of capacitors on tape (in mm)

| Item                                             | Code                                         | Lead Code                           |          |                                     |          |          |                                     |
|--------------------------------------------------|----------------------------------------------|-------------------------------------|----------|-------------------------------------|----------|----------|-------------------------------------|
|                                                  |                                              | DB                                  | DG       | E1                                  | M1       | M2       | S1                                  |
| Pitch of component                               | P                                            | 12.7±1.0                            |          |                                     |          |          |                                     |
| Pitch of sprocket hole                           | P <sub>0</sub>                               | 12.7±0.2                            |          |                                     |          |          |                                     |
| Lead spacing                                     | F                                            | 2.5 <sup>+0.4</sup> <sub>-0.2</sub> |          | 5.0 <sup>+0.6</sup> <sub>-0.2</sub> |          |          | 2.5 <sup>+0.4</sup> <sub>-0.2</sub> |
| Length from hole center to component center      | P <sub>2</sub>                               | 6.35±1.3                            |          |                                     |          |          |                                     |
| Length from hole center to lead                  | P <sub>1</sub>                               | 5.1±0.7                             |          | 3.85±0.7                            |          |          | 5.1±0.7                             |
|                                                  | 254±1.5 total length of componestspitch × 20 |                                     |          |                                     |          |          |                                     |
| Deviation along tape, left or right defect       | ΔS                                           | 0±2.0                               |          |                                     |          |          |                                     |
| Carrier tape width                               | W                                            | 18.0±0.5                            |          |                                     |          |          |                                     |
| Position of sprocket hole                        | W <sub>1</sub>                               | 9.0 <sup>+0</sup> <sub>-0.5</sub>   |          |                                     |          |          |                                     |
| Lead distance between reference and bottom plane | H <sub>0</sub>                               | -                                   |          |                                     | 16.0±0.5 | 20.0±0.5 | 16.0±0.5                            |
|                                                  | H                                            | 16.0±0.5                            | 20.0±0.5 | 17.5±0.5                            | -        |          |                                     |
| Protrusion length                                | ℓ                                            | 0.5 max.                            |          |                                     |          |          |                                     |
| Diameter of sprocket hole                        | D <sub>0</sub>                               | 4.0±0.1                             |          |                                     |          |          |                                     |
| Lead diameter                                    | d                                            | 0.5±0.05                            |          |                                     |          |          |                                     |
| Total tape thickness                             | t <sub>1</sub>                               | 0.6±0.3                             |          |                                     |          |          |                                     |
| Total thickness of tape and lead wire            | t <sub>2</sub>                               | 1.5 max.                            |          |                                     |          |          |                                     |
| Body thickness                                   | T                                            | Depends on Part Number              |          |                                     |          |          |                                     |
| Deviation across tape                            | Δh <sub>1</sub>                              | 1.0 max.                            |          |                                     |          |          |                                     |
|                                                  | Δh <sub>2</sub>                              | (Dimension code W, U: 2.0 max.)     |          |                                     |          |          |                                     |
| Portion to cut in case of defect                 | L                                            | 11.0 <sup>+0</sup> <sub>-1.0</sub>  |          |                                     |          |          |                                     |
| Hold down tape width                             | W <sub>0</sub>                               | 9.5 min.                            |          |                                     |          |          |                                     |
| Hold down tape position                          | W <sub>2</sub>                               | 1.5±1.5                             |          |                                     |          |          |                                     |

## ⚠Caution

### ⚠Caution (Storage and Operating Condition)

#### Operating and storage environment

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. Also avoid exposure to moisture. Before cleaning, bonding or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended

equipment. Store the capacitors where the temperature and relative humidity do not exceed 5 to 40 degrees centigrade and 20 to 70%. Use capacitors within 6 months after delivery.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

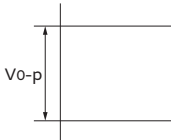
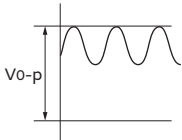
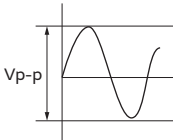
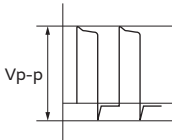
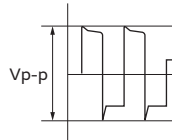
### ⚠Caution (Rating)

#### 1. Operating Voltage

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the  $V_{p-p}$  value of the applied voltage or the  $V_{0-p}$  which contains DC bias within the rated voltage range.

When the voltage is applied to the circuit, starting or stopping may generate irregular voltage for a transit period because of resonance or switching. Be sure to use a capacitor with a rated voltage range that includes these irregular voltages.

When DC-rated capacitors are to be used in input circuits from commercial power source (AC filter), be sure to use Safety Recognized Capacitors because various regulations on withstand voltage or impulse withstand established for all equipment should be taken into consideration.

| Voltage                | DC Voltage                                                                          | DC+AC Voltage                                                                       | AC Voltage                                                                          | Pulse Voltage (1)                                                                     | Pulse Voltage (2)                                                                     |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Positional Measurement |  |  |  |  |  |

#### 2. Operating Temperature

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself (Please refer to the following column 3) and by peripheral components.

temperature and a heat from peripheral components are stable.

The self-generated heat should be measured under the conditions where the capacitor is subjected at an atmosphere temperature 25°C and is not affected by radiant heat from other components or wind from surroundings.

#### 3. Self-generated Heat

When the capacitor is used in a high-frequency current, pulse current or similar current, it may have self-generated heat due to dielectric loss. In the case of "High Dielectric Constant Type Capacitors", applied voltage load should be such that self-generated heat is within 20 °C under the condition where the capacitor is subjected at an atmosphere temperature of 25 °C. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. Please contact us if self-generated heat occurs with "Temperature Compensating Type Capacitors".

When measuring, use a thermocouple of small thermal capacity -K of ø0.1mm.

Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.

#### 4. Measurement of Temperature

The surface temperature of capacitor should be measured under the condition where an atmosphere

#### 5. Fail-Safe

Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

## ⚠Caution

### ⚠Caution (Soldering and Mounting)

#### 1. Vibration and impact

Do not expose a capacitor or its leads to excessive shock or vibration during use.

#### 2. Soldering

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.

#### 3. Bonding, resin molding and coating

In case of bonding, molding or coating this product, verify that these processes do not affect the quality of the capacitor by testing the performance of the bonded, molded or coated product in the intended equipment.

In case the amount of application, dryness/hardening conditions of adhesives and molding resins

containing organic solvents (ethyl acetate, methyl ethyl ketone, toluene, etc.) are unsuitable, the outer coating resin of a capacitor may be damaged by the organic solvents and may result, worst case, in a short circuit.

The variation in thickness of adhesive or molding resin or coating may cause an outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

#### 4. Treatment after bonding, resin molding and coating

When the outer coating is hot (over 100 degrees centigrade) after soldering, it becomes soft and fragile, so please be careful not to give it mechanical stress.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

### ⚠Caution (Handling)

#### Vibration and impact

Do not expose a capacitor or its leads to excessive shock or vibration during use.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

## Notice

### Notice (Rating)

---

#### Capacitance change of capacitor

In case of high dielectric constant type capacitors  
Capacitors have an aging characteristic, whereby  
the capacitor continually decreases its capacitance  
slightly if the capacitor is left on for a long  
time. Moreover, capacitance might change greatly  
depending on the surrounding temperature or an  
applied voltage.

### Notice (Soldering and Mounting)

---

#### 1. Cleaning (ultrasonic cleaning)

To perform ultrasonic cleaning, observe the following  
conditions.

Rinse bath capacity: Output of 20 watts per liter or less.

Rinsing time: 5 min. maximum.

Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue  
destruction of the lead wires.

#### 2. Soldering and Mounting

##### Insertion of the Lead Wire

- When soldering, insert the lead wire into the PCB without  
mechanically stressing the lead wire.
- Insert the lead wire into the PCB with a distance appropriate to  
the lead space.

# Global Locations

For details please visit [www.murata.com](http://www.murata.com)



## ⚠ Note

### 1 Export Control

#### For customers outside Japan:

No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

#### For customers in Japan:

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

2 Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.

- ① Aircraft equipment
- ② Aerospace equipment
- ③ Undersea equipment
- ④ Power plant equipment
- ⑤ Medical equipment
- ⑥ Transportation equipment (vehicles, trains, ships, etc.)
- ⑦ Traffic signal equipment
- ⑧ Disaster prevention / crime prevention equipment
- ⑨ Data-processing equipment
- ⑩ Application of similar complexity and/or reliability requirements to the applications listed above

3 Product specifications in this catalog are as of February 2018. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.

4 Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

5 This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

6 Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.

7 No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

Murata Manufacturing Co., Ltd.

[www.murata.com](http://www.murata.com)