

# MC74AC74, MC74ACT74

## Dual D-Type Positive Edge-Triggered Flip-Flop

The MC74AC74/74ACT74 is a dual D-type flip-flop with Asynchronous Clear and Set inputs and complementary ( $Q, \bar{Q}$ ) outputs. Information at the input is transferred to the outputs on the positive edge of the clock pulse. Clock triggering occurs at a voltage level of the clock pulse and is not directly related to the transition time of the positive-going pulse. After the Clock Pulse input threshold voltage has been passed, the Data input is locked out and information present will not be transferred to the outputs until the next rising edge of the Clock Pulse input.

Asynchronous Inputs:

LOW input to  $\bar{S}_D$  (Set) sets Q to HIGH level

LOW input to  $\bar{C}_D$  (Clear) sets Q to LOW level

Clear and Set are independent of clock

Simultaneous LOW on  $\bar{C}_D$  and  $\bar{S}_D$  makes both Q and  $\bar{Q}$  HIGH

### Features

- Outputs Source/Sink 24 mA
- 'ACT74 Has TTL Compatible Inputs
- Pb-Free Packages are Available

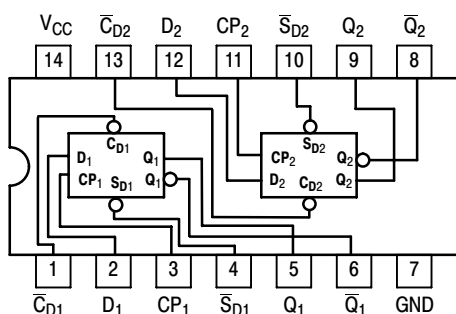


Figure 1. Pinout: 14-Lead Packages Conductors  
(Top View)

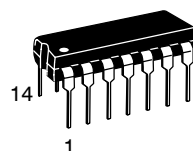
### PIN ASSIGNMENT

| PIN                              | FUNCTION            |
|----------------------------------|---------------------|
| $D_1, D_2$                       | Data Inputs         |
| $CP_1, CP_2$                     | Clock Pulse Inputs  |
| $\bar{C}_{D1}, \bar{C}_{D2}$     | Direct Clear Inputs |
| $\bar{S}_{D1}, \bar{S}_{D2}$     | Direct Set Inputs   |
| $Q_1, \bar{Q}_1, Q_2, \bar{Q}_2$ | Outputs             |

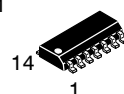


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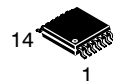
<http://onsemi.com>



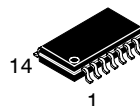
PDIP-14  
N SUFFIX  
CASE 646



SOIC-14  
D SUFFIX  
CASE 751A



TSSOP-14  
DT SUFFIX  
CASE 948G



SOEIAJ-14  
M SUFFIX  
CASE 965

### ORDERING INFORMATION

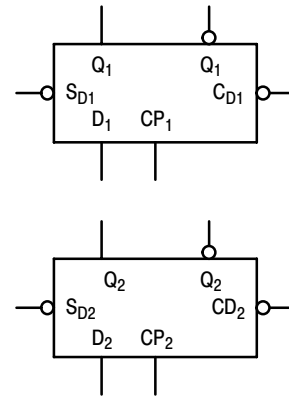
See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

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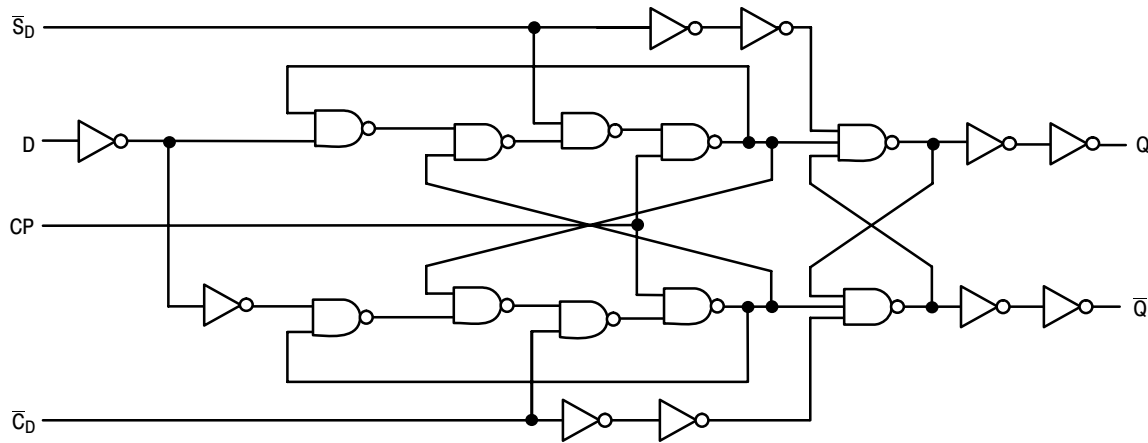
**TRUTH TABLE** (Each Half)

| Inputs      |             |                                                                                   |   | Outputs |             |
|-------------|-------------|-----------------------------------------------------------------------------------|---|---------|-------------|
| $\bar{S}_D$ | $\bar{C}_D$ | CP                                                                                | D | Q       | $\bar{Q}$   |
| L           | H           | X                                                                                 | X | H       | L           |
| H           | L           | X                                                                                 | X | L       | H           |
| L           | L           | X                                                                                 | X | H       | H           |
| H           | H           |  | H | H       | L           |
| H           | H           |  | L | L       | H           |
| H           | H           | L                                                                                 | X | $Q_0$   | $\bar{Q}_0$ |

NOTE: H = HIGH Voltage Level  
 L = LOW Voltage Level  
 X = Immaterial;  
 = LOW-to-HIGH Clock Transition  
 $Q_0(\bar{Q}_0)$  = Previous  $Q(\bar{Q})$  before LOW-to-HIGH Transition of Clock



**Figure 2. Logic Symbol**



NOTE: This diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

**Figure 3. Logic Diagram**

## MAXIMUM RATINGS

| Symbol    | Parameter                                 | Value                  | Unit               |
|-----------|-------------------------------------------|------------------------|--------------------|
| $V_{CC}$  | DC Supply Voltage (Referenced to GND)     | -0.5 to +7.0           | V                  |
| $V_{in}$  | DC Input Voltage (Referenced to GND)      | -0.5 to $V_{CC} + 0.5$ | V                  |
| $V_{out}$ | DC Output Voltage (Referenced to GND)     | -0.5 to $V_{CC} + 0.5$ | V                  |
| $I_{in}$  | DC Input Current, per Pin                 | $\pm 20$               | mA                 |
| $I_{out}$ | DC Output Sink/Source Current, per Pin    | $\pm 50$               | mA                 |
| $I_{CC}$  | DC $V_{CC}$ or GND Current per Output Pin | $\pm 50$               | mA                 |
| $T_{stg}$ | Storage Temperature                       | -65 to +150            | $^{\circ}\text{C}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

# MC74AC74, MC74ACT74

## RECOMMENDED OPERATING CONDITIONS

| Symbol                             | Parameter                                                              | Min                     | Typ | Max             | Unit |
|------------------------------------|------------------------------------------------------------------------|-------------------------|-----|-----------------|------|
| V <sub>CC</sub>                    | Supply Voltage                                                         | 'AC                     | 2.0 | 5.0             | V    |
|                                    |                                                                        | 'ACT                    | 4.5 | 5.0             |      |
| V <sub>in</sub> , V <sub>out</sub> | DC Input Voltage, Output Voltage (Ref. to GND)                         | 0                       | –   | V <sub>CC</sub> | V    |
| t <sub>r</sub> , t <sub>f</sub>    | Input Rise and Fall Time (Note )<br>'AC Devices except Schmitt Inputs  | V <sub>CC</sub> @ 3.0 V | –   | 150             | ns/V |
|                                    |                                                                        | V <sub>CC</sub> @ 4.5 V | –   | 40              |      |
|                                    |                                                                        | V <sub>CC</sub> @ 5.5 V | –   | 25              |      |
| t <sub>r</sub> , t <sub>f</sub>    | Input Rise and Fall Time (Note )<br>'ACT Devices except Schmitt Inputs | V <sub>CC</sub> @ 4.5 V | –   | 10              | ns/V |
|                                    |                                                                        | V <sub>CC</sub> @ 5.5 V | –   | 8.0             |      |
| T <sub>J</sub>                     | Junction Temperature (PDIP)                                            | –                       | –   | 140             | °C   |
| T <sub>A</sub>                     | Operating Ambient Temperature Range                                    | –40                     | 25  | 85              | °C   |
| I <sub>OH</sub>                    | Output Current – High                                                  | –                       | –   | –24             | mA   |
| I <sub>OL</sub>                    | Output Current – Low                                                   | –                       | –   | 24              | mA   |

1. V<sub>in</sub> from 30% to 70% V<sub>CC</sub>; see individual Data Sheets for devices that differ from the typical input rise and fall times.
2. V<sub>in</sub> from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

## DC CHARACTERISTICS

| Symbol           | Parameter                            | V <sub>CC</sub><br>(V) | 74AC                   |                   | 74AC                                  | Unit | Conditions                                                                                          |
|------------------|--------------------------------------|------------------------|------------------------|-------------------|---------------------------------------|------|-----------------------------------------------------------------------------------------------------|
|                  |                                      |                        | T <sub>A</sub> = +25°C |                   | T <sub>A</sub> =<br>–40°C to<br>+85°C |      |                                                                                                     |
|                  |                                      |                        | Typ                    | Guaranteed Limits |                                       |      |                                                                                                     |
| V <sub>IH</sub>  | Minimum High Level<br>Input Voltage  | 3.0                    | 1.5                    | 2.1               | 2.1                                   | V    | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 V                                              |
|                  |                                      | 4.5                    | 2.25                   | 3.15              | 3.15                                  |      |                                                                                                     |
|                  |                                      | 5.5                    | 2.75                   | 3.85              | 3.85                                  |      |                                                                                                     |
| V <sub>IL</sub>  | Maximum Low Level<br>Input Voltage   | 3.0                    | 1.5                    | 0.9               | 0.9                                   | V    | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 V                                              |
|                  |                                      | 4.5                    | 2.25                   | 1.35              | 1.35                                  |      |                                                                                                     |
|                  |                                      | 5.5                    | 2.75                   | 1.65              | 1.65                                  |      |                                                                                                     |
| V <sub>OH</sub>  | Minimum High Level<br>Output Voltage | 3.0                    | 2.99                   | 2.9               | 2.9                                   | V    | I <sub>OUT</sub> = –50 μA                                                                           |
|                  |                                      | 4.5                    | 4.49                   | 4.4               | 4.4                                   |      |                                                                                                     |
|                  |                                      | 5.5                    | 5.49                   | 5.4               | 5.4                                   |      |                                                                                                     |
|                  |                                      | 3.0                    | –                      | 2.56              | 2.46                                  | V    | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>–12 mA<br>I <sub>OH</sub> –24 mA<br>–24 mA |
|                  |                                      | 4.5                    | –                      | 3.86              | 3.76                                  |      |                                                                                                     |
|                  |                                      | 5.5                    | –                      | 4.86              | 4.76                                  |      |                                                                                                     |
| V <sub>OL</sub>  | Maximum Low Level<br>Output Voltage  | 3.0                    | 0.002                  | 0.1               | 0.1                                   | V    | I <sub>OUT</sub> = 50 μA                                                                            |
|                  |                                      | 4.5                    | 0.001                  | 0.1               | 0.1                                   |      |                                                                                                     |
|                  |                                      | 5.5                    | 0.001                  | 0.1               | 0.1                                   |      |                                                                                                     |
|                  |                                      | 3.0                    | –                      | 0.36              | 0.44                                  | V    | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>12 mA<br>I <sub>OL</sub> 24 mA<br>24 mA    |
|                  |                                      | 4.5                    | –                      | 0.36              | 0.44                                  |      |                                                                                                     |
|                  |                                      | 5.5                    | –                      | 0.36              | 0.44                                  |      |                                                                                                     |
| I <sub>IN</sub>  | Maximum Input<br>Leakage Current     | 5.5                    | –                      | ±0.1              | ±1.0                                  | μA   | V <sub>I</sub> = V <sub>CC</sub> , GND                                                              |
| I <sub>OLD</sub> | †Minimum Dynamic<br>Output Current   | 5.5                    | –                      | –                 | 75                                    | mA   | V <sub>OLD</sub> = 1.65 V Max                                                                       |
| I <sub>OHD</sub> |                                      | 5.5                    | –                      | –                 | –75                                   | mA   | V <sub>OHD</sub> = 3.85 V Min                                                                       |
| I <sub>CC</sub>  | Maximum Quiescent<br>Supply Current  | 5.5                    | –                      | 4.0               | 40                                    | μA   | V <sub>IN</sub> = V <sub>CC</sub> or GND                                                            |

\*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

NOTE: I<sub>IN</sub> and I<sub>CC</sub> @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V<sub>CC</sub>.

# MC74AC74, MC74ACT74

## AC CHARACTERISTICS (For Figures and Waveforms – See Section 3 of the ON Semiconductor FACT Data Book, DL138/D)

| Symbol           | Parameter                                                                                      | V <sub>CC</sub> *<br>(V) | 74AC                                             |             |              | 74AC                                                         |              | Unit | Fig.<br>No. |
|------------------|------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------|-------------|--------------|--------------------------------------------------------------|--------------|------|-------------|
|                  |                                                                                                |                          | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |             |              | T <sub>A</sub> = −40°C<br>to +85°C<br>C <sub>L</sub> = 50 pF |              |      |             |
|                  |                                                                                                |                          | Min                                              | Typ         | Max          | Min                                                          | Max          |      |             |
| f <sub>max</sub> | Maximum Clock<br>Frequency                                                                     | 3.3<br>5.0               | 100<br>140                                       | 125<br>160  | –<br>–       | 95<br>125                                                    | –<br>–       | MHz  | 3–3         |
| t <sub>PLH</sub> | Propagation Delay<br>C̄ <sub>Dn</sub> or S̄ <sub>Dn</sub> to Q <sub>n</sub> or Q̄ <sub>n</sub> | 3.3<br>5.0               | 5.0<br>3.5                                       | 8.0<br>6.0  | 12.5<br>9.0  | 4.0<br>3.0                                                   | 13.0<br>10.0 | ns   | 3–6         |
| t <sub>PHL</sub> | Propagation Delay<br>C̄ <sub>Dn</sub> or S̄ <sub>Dn</sub> to Q <sub>n</sub> or Q̄ <sub>n</sub> | 3.3<br>5.0               | 4.0<br>3.0                                       | 10.5<br>8.0 | 12.0<br>9.5  | 3.5<br>2.5                                                   | 13.5<br>10.5 | ns   | 3–6         |
| t <sub>PLH</sub> | Propagation Delay<br>C <sub>Pn</sub> to Q <sub>n</sub> or Q̄ <sub>n</sub>                      | 3.3<br>5.0               | 4.5<br>3.5                                       | 8.0<br>6.0  | 13.5<br>10.0 | 4.0<br>3.0                                                   | 16.0<br>10.5 | ns   | 3–6         |
| t <sub>PHL</sub> | Propagation Delay<br>C <sub>Pn</sub> to Q <sub>n</sub> or Q̄ <sub>n</sub>                      | 3.3<br>5.0               | 3.5<br>2.5                                       | 8.0<br>6.0  | 14.0<br>10.0 | 3.5<br>2.5                                                   | 14.5<br>10.5 | ns   | 3–6         |

\*Voltage Range 3.3 V is 3.3 V ±0.3 V.  
Voltage Range 5.0 V is 5.0 V ±0.5 V.

## AC OPERATING REQUIREMENTS

| Symbol           | Parameter                                                            | V <sub>CC</sub> *<br>(V) | 74AC                                             |                    | 74AC                                                         | Unit | Fig.<br>No. |
|------------------|----------------------------------------------------------------------|--------------------------|--------------------------------------------------|--------------------|--------------------------------------------------------------|------|-------------|
|                  |                                                                      |                          | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |                    | T <sub>A</sub> = -40°C<br>to +85°C<br>C <sub>L</sub> = 50 pF |      |             |
|                  |                                                                      |                          | Typ                                              | Guaranteed Minimum |                                                              |      |             |
| t <sub>s</sub>   | Set-up Time, HIGH or LOW<br>D <sub>n</sub> to CP <sub>n</sub>        | 3.3<br>5.0               | 1.5<br>1.0                                       | 4.0<br>3.0         | 4.5<br>3.0                                                   | ns   | 3-9         |
| t <sub>h</sub>   | Hold Time, HIGH or LOW<br>D <sub>n</sub> to CP <sub>n</sub>          | 3.3<br>5.0               | -2.0<br>-1.5                                     | 0.5<br>0.5         | 0.5<br>0.5                                                   | ns   | 3-9         |
| t <sub>w</sub>   | CP <sub>n</sub> or C <sub>Dn</sub> or S <sub>Dn</sub><br>Pulse Width | 3.3<br>5.0               | 3.0<br>2.5                                       | 5.5<br>4.5         | 7.0<br>5.0                                                   | ns   | 3-6         |
| t <sub>rec</sub> | Recovery Time<br>C <sub>Dn</sub> or S <sub>Dn</sub> to CP            | 3.3<br>5.0               | -2.5<br>-2.0                                     | 0<br>0             | 0<br>0                                                       | ns   | 3-9         |

\*Voltage Range 3.3 V is 3.3 V ±0.3 V.  
Voltage Range 5.0 V is 5.0 V ±0.5 V.

# MC74AC74, MC74ACT74

## DC CHARACTERISTICS

| Symbol            | Parameter                              | V <sub>CC</sub><br>(V) | 74ACT                  |                   | 74ACT                                 | Unit | Conditions                                                                                |
|-------------------|----------------------------------------|------------------------|------------------------|-------------------|---------------------------------------|------|-------------------------------------------------------------------------------------------|
|                   |                                        |                        | T <sub>A</sub> = +25°C |                   | T <sub>A</sub> =<br>–40°C to<br>+85°C |      |                                                                                           |
|                   |                                        |                        | Typ                    | Guaranteed Limits |                                       |      |                                                                                           |
| V <sub>IH</sub>   | Minimum High Level<br>Input Voltage    | 4.5<br>5.5             | 1.5<br>1.5             | 2.0<br>2.0        | 2.0<br>2.0                            | V    | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 V                                    |
| V <sub>IL</sub>   | Maximum Low Level<br>Input Voltage     | 4.5<br>5.5             | 1.5<br>1.5             | 0.8<br>0.8        | 0.8<br>0.8                            | V    | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 V                                    |
| V <sub>OH</sub>   | Minimum High Level<br>Output Voltage   | 4.5<br>5.5             | 4.49<br>5.49           | 4.4<br>5.4        | 4.4<br>5.4                            | V    | I <sub>OUT</sub> = –50 μA                                                                 |
|                   |                                        | 4.5<br>5.5             | –<br>–                 | 3.86<br>4.86      | 3.76<br>4.76                          | V    | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>–24 mA<br>I <sub>OH</sub> –24 mA |
| V <sub>OL</sub>   | Maximum Low Level<br>Output Voltage    | 4.5<br>5.5             | 0.001<br>0.001         | 0.1<br>0.1        | 0.1<br>0.1                            | V    | I <sub>OUT</sub> = 50 μA                                                                  |
|                   |                                        | 4.5<br>5.5             | –<br>–                 | 0.36<br>0.36      | 0.44<br>0.44                          | V    | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>24 mA<br>I <sub>OL</sub> 24 mA   |
| I <sub>IN</sub>   | Maximum Input<br>Leakage Current       | 5.5                    | –                      | ±0.1              | ±1.0                                  | μA   | V <sub>I</sub> = V <sub>CC</sub> , GND                                                    |
| ΔI <sub>CCT</sub> | Additional Max. I <sub>CC</sub> /Input | 5.5                    | 0.6                    | –                 | 1.5                                   | mA   | V <sub>I</sub> = V <sub>CC</sub> – 2.1 V                                                  |
| I <sub>OLD</sub>  | †Minimum Dynamic<br>Output Current     | 5.5                    | –                      | –                 | 75                                    | mA   | V <sub>OLD</sub> = 1.65 V Max                                                             |
| I <sub>OHD</sub>  |                                        | 5.5                    | –                      | –                 | –75                                   | mA   | V <sub>OHD</sub> = 3.85 V Min                                                             |
| I <sub>CC</sub>   | Maximum Quiescent<br>Supply Current    | 5.5                    | –                      | 4.0               | 40                                    | μA   | V <sub>IN</sub> = V <sub>CC</sub> or GND                                                  |

\*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

## AC CHARACTERISTICS (For Figures and Waveforms – See Section 3 of the ON Semiconductor FACT Data Book, DL138/D)

| Symbol           | Parameter                                                                                      | V <sub>CC</sub> *<br>(V) | 74ACT                                            |     |      | 74ACT                                                        |      | Unit | Fig.<br>No. |
|------------------|------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------|-----|------|--------------------------------------------------------------|------|------|-------------|
|                  |                                                                                                |                          | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |     |      | T <sub>A</sub> = −40°C<br>to +85°C<br>C <sub>L</sub> = 50 pF |      |      |             |
|                  |                                                                                                |                          | Min                                              | Typ | Max  | Min                                                          | Max  |      |             |
| f <sub>max</sub> | Maximum Clock<br>Frequency                                                                     | 5.0                      | 145                                              | 210 | –    | 125                                                          | –    | MHz  | 3–3         |
| t <sub>PLH</sub> | Propagation Delay<br>C̄ <sub>Dn</sub> or S̄ <sub>Dn</sub> to Q <sub>n</sub> or Q̄ <sub>n</sub> | 5.0                      | 3.0                                              | 5.5 | 9.5  | 2.5                                                          | 10.5 | ns   | 3–6         |
| t <sub>PHL</sub> | Propagation Delay<br>C̄ <sub>Dn</sub> or S̄ <sub>Dn</sub> to Q <sub>n</sub> or Q̄ <sub>n</sub> | 5.0                      | 3.0                                              | 6.0 | 10.0 | 3.0                                                          | 11.5 | ns   | 3–6         |
| t <sub>PLH</sub> | Propagation Delay<br>C <sub>Pn</sub> to Q <sub>n</sub> or Q̄ <sub>n</sub>                      | 5.0                      | 4.0                                              | 7.5 | 11.0 | 4.0                                                          | 13.0 | ns   | 3–6         |
| t <sub>PHL</sub> | Propagation Delay<br>C <sub>Pn</sub> to Q <sub>n</sub> or Q̄ <sub>n</sub>                      | 5.0                      | 3.5                                              | 6.0 | 10.0 | 3.0                                                          | 11.5 | ns   | 3–6         |

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.

# MC74AC74, MC74ACT74

## AC OPERATING REQUIREMENTS

| Symbol           | Parameter                                                                    | V <sub>CC</sub> *<br>(V) | 74ACT                                            |                    | 74ACT                                                        | Unit | Fig.<br>No. |
|------------------|------------------------------------------------------------------------------|--------------------------|--------------------------------------------------|--------------------|--------------------------------------------------------------|------|-------------|
|                  |                                                                              |                          | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |                    | T <sub>A</sub> = -40°C<br>to +85°C<br>C <sub>L</sub> = 50 pF |      |             |
|                  |                                                                              |                          | Typ                                              | Guaranteed Minimum |                                                              |      |             |
| t <sub>s</sub>   | Set-up Time, HIGH or LOW<br>D <sub>n</sub> to CP <sub>n</sub>                | 5.0                      | 1.0                                              | 3.0                | 3.5                                                          | ns   | 3-9         |
| t <sub>h</sub>   | Hold Time, HIGH or LOW<br>D <sub>n</sub> to CP <sub>n</sub>                  | 5.0                      | -0.5                                             | 1.0                | 1.0                                                          | ns   | 3-9         |
| t <sub>w</sub>   | C <sub>Pn</sub> or $\overline{C}_{Dn}$ or $\overline{S}_{Dn}$<br>Pulse Width | 5.0                      | 3.0                                              | 5.0                | 6.0                                                          | ns   | 3-6         |
| t <sub>rec</sub> | Recovery Time<br>$\overline{C}_{Dn}$ or $\overline{S}_{Dn}$ to CP            | 5.0                      | -2.5                                             | 0                  | 0                                                            | ns   | 3-9         |

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.

## CAPACITANCE

| Symbol          | Parameter                     | Value<br>Typ | Unit | Test Conditions         |
|-----------------|-------------------------------|--------------|------|-------------------------|
| C <sub>IN</sub> | Input Capacitance             | 4.5          | pF   | V <sub>CC</sub> = 5.0 V |
| C <sub>PD</sub> | Power Dissipation Capacitance | 35           | pF   | V <sub>CC</sub> = 5.0 V |

# MC74AC74, MC74ACT74

## ORDERING INFORMATION

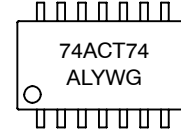
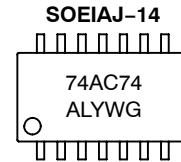
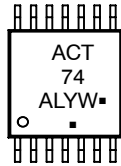
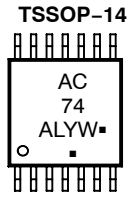
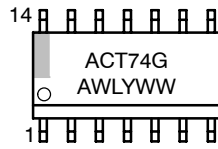
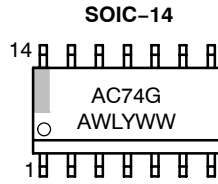
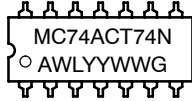
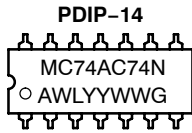
| Device         | Package                | Shipping†        |
|----------------|------------------------|------------------|
| MC74AC74N      | PDIP-14                | 25 Units/Rail    |
| MC74AC74NG     | PDIP-14<br>(Pb-Free)   |                  |
| MC74ACT74N     | PDIP-14                |                  |
| MC74ACT74NG    | PDIP-14<br>(Pb-Free)   |                  |
| MC74AC74D      | SOIC-14                | 55 Units/Rail    |
| MC74AC74DG     | SOIC-14<br>(Pb-Free)   |                  |
| MC74AC74DR2    | SOIC-14                | 2500/Tape & Reel |
| MC74AC74DR2G   | SOIC-14<br>(Pb-Free)   |                  |
| MC74ACT74D     | SOIC-14                | 55 Units/Rail    |
| MC74ACT74DG    | SOIC-14<br>(Pb-Free)   |                  |
| MC74ACT74DR2   | SOIC-14                | 2500/Tape & Reel |
| MC74ACT74DR2G  | SOIC-14<br>(Pb-Free)   |                  |
| MC74AC74DT     | TSSOP-14*              | 96 Units/Rail    |
| MC74AC74DTR2   | TSSOP-14*              | 2500/Tape & Reel |
| MC74AC74DTR2G  | TSSOP-14*              |                  |
| MC74ACT74DT    | TSSOP-14*              | 96 Units/Rail    |
| MC74ACT74DTR2  | TSSOP-14*              | 2500/Tape & Reel |
| MC74ACT74DTR2G | TSSOP-14*              |                  |
| MC74AC74MEL    | SOEIAJ-14              | 2000/Tape & Reel |
| MC74AC74MELG   | SOEIAJ-14<br>(Pb-Free) |                  |
| MC74ACT74MEL   | SOEIAJ-14              |                  |
| MC74ACT74MELG  | SOEIAJ-14<br>(Pb-Free) |                  |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*This package is inherently Pb-Free.

# MC74AC74, MC74ACT74

## MARKING DIAGRAMS

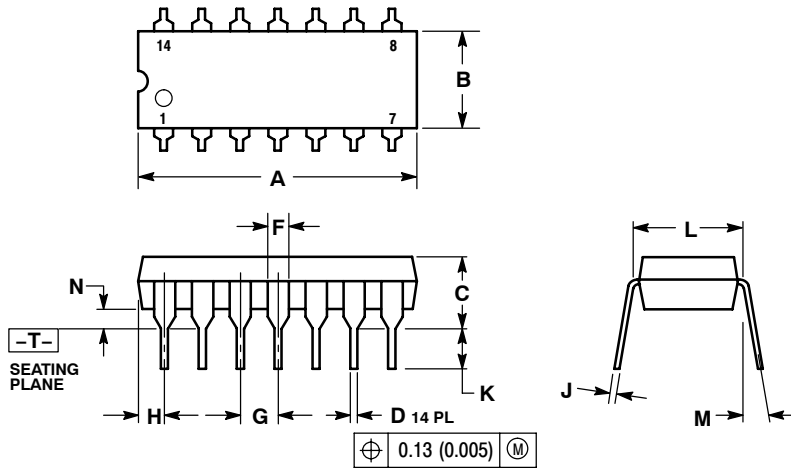


A = Assembly Location  
 WL, L = Wafer Lot  
 YY, Y = Year  
 WW, W = Work Week  
 G or ■ = Pb-Free Package  
 (Note: Microdot may be in either location)

# MC74AC74, MC74ACT74

## PACKAGE DIMENSIONS

**PDIP-14**  
CASE 646-06  
ISSUE P



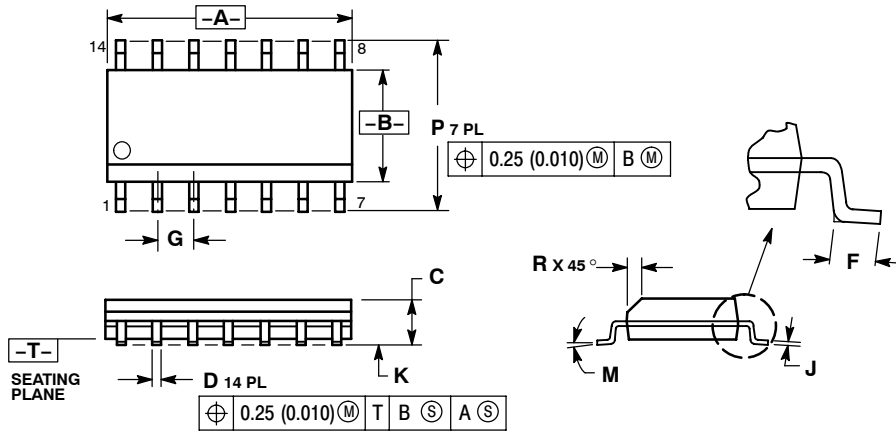
### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.715     | 0.770 | 18.16       | 19.56 |
| B   | 0.240     | 0.260 | 6.10        | 6.60  |
| C   | 0.145     | 0.185 | 3.69        | 4.69  |
| D   | 0.015     | 0.021 | 0.38        | 0.53  |
| F   | 0.040     | 0.070 | 1.02        | 1.78  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| H   | 0.052     | 0.095 | 1.32        | 2.41  |
| J   | 0.008     | 0.015 | 0.20        | 0.38  |
| K   | 0.115     | 0.135 | 2.92        | 3.43  |
| L   | 0.290     | 0.310 | 7.37        | 7.87  |
| M   | ---       | 10 °  | ---         | 10 °  |
| N   | 0.015     | 0.039 | 0.38        | 1.01  |

# MC74AC74, MC74ACT74

SOIC-14  
CASE 751A-03  
ISSUE H

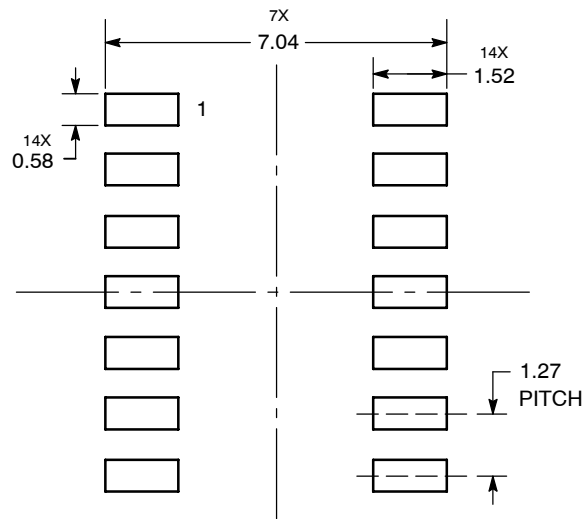


## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 8.55        | 8.75 | 0.337     | 0.344 |
| B   | 3.80        | 4.00 | 0.150     | 0.157 |
| C   | 1.35        | 1.75 | 0.054     | 0.068 |
| D   | 0.35        | 0.49 | 0.014     | 0.019 |
| F   | 0.40        | 1.25 | 0.016     | 0.049 |
| G   | 1.27 BSC    |      | 0.050 BSC |       |
| J   | 0.19        | 0.25 | 0.008     | 0.009 |
| K   | 0.10        | 0.25 | 0.004     | 0.009 |
| M   | 0°          | 7°   | 0°        | 7°    |
| P   | 5.80        | 6.20 | 0.228     | 0.244 |
| R   | 0.25        | 0.50 | 0.010     | 0.019 |

## SOLDERING FOOTPRINT\*



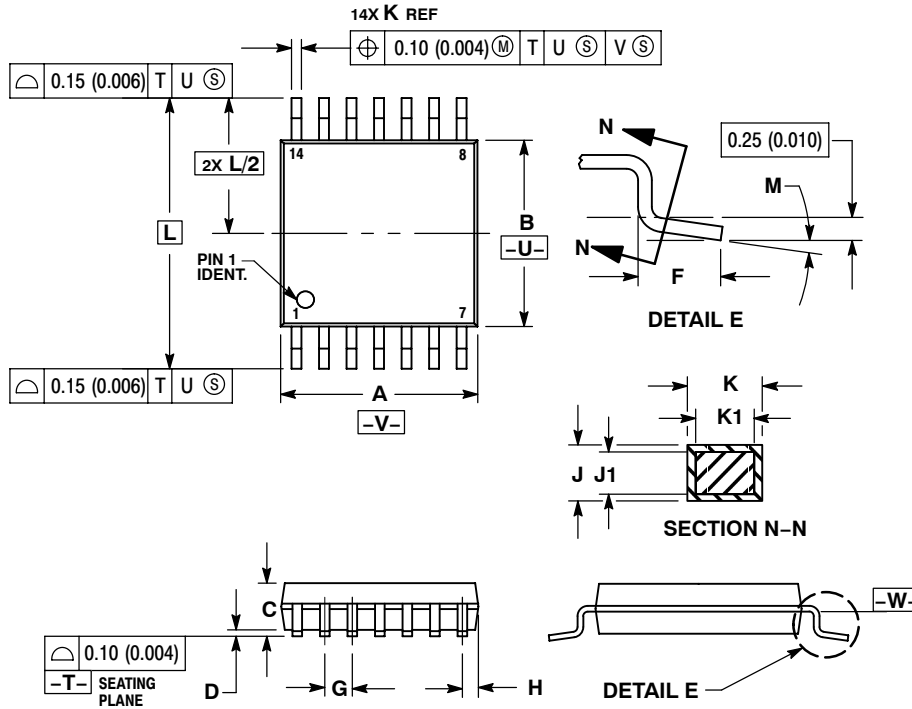
DIMENSIONS: MILLIMETERS

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MC74AC74, MC74ACT74

## PACKAGE DIMENSIONS

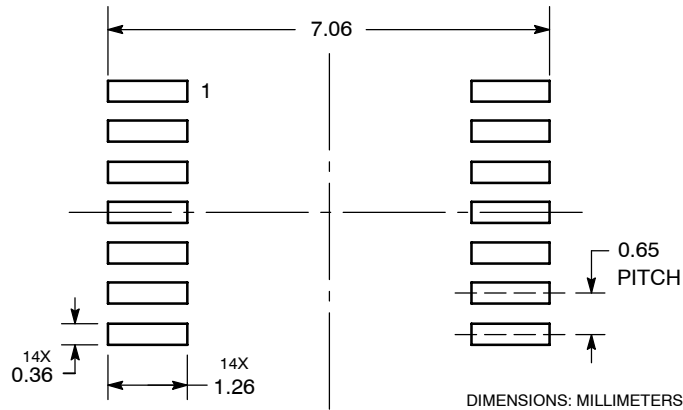
TSSOP-14  
CASE 948G-01  
ISSUE B



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.
  3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
  4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
  5. DIMENSION K DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE K DIMENSION AT MAXIMUM MATERIAL CONDITION.
  6. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
  7. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 4.90        | 5.10 | 0.193     | 0.200 |
| B   | 4.30        | 4.50 | 0.169     | 0.177 |
| C   | ---         | 1.20 | ---       | 0.047 |
| D   | 0.05        | 0.15 | 0.002     | 0.006 |
| F   | 0.50        | 0.75 | 0.020     | 0.030 |
| G   | 0.65 BSC    |      | 0.026 BSC |       |
| H   | 0.50        | 0.60 | 0.020     | 0.024 |
| J   | 0.09        | 0.20 | 0.004     | 0.008 |
| J1  | 0.09        | 0.16 | 0.004     | 0.006 |
| K   | 0.19        | 0.30 | 0.007     | 0.012 |
| K1  | 0.19        | 0.25 | 0.007     | 0.010 |
| L   | 6.40 BSC    |      | 0.252 BSC |       |
| M   | 0°          | 8°   | 0°        | 8°    |

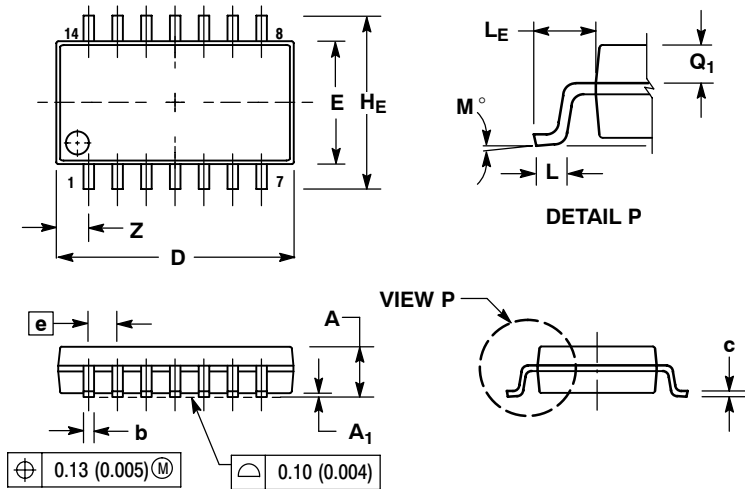
### SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MC74AC74, MC74ACT74

SOEIAJ-14  
CASE 965-01  
ISSUE A



## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS AND ARE MEASURED AT THE PARTING LINE. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
5. THE LEAD WIDTH DIMENSION (b) DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE LEAD WIDTH DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE FOOT. MINIMUM SPACE BETWEEN PROTRUSIONS AND ADJACENT LEAD TO BE 0.46 (0.018).

| DIM            | MILLIMETERS |       | INCHES    |       |
|----------------|-------------|-------|-----------|-------|
|                | MIN         | MAX   | MIN       | MAX   |
| A              | ---         | 2.05  | ---       | 0.081 |
| A <sub>1</sub> | 0.05        | 0.20  | 0.002     | 0.008 |
| b              | 0.35        | 0.50  | 0.014     | 0.020 |
| c              | 0.10        | 0.20  | 0.004     | 0.008 |
| D              | 9.90        | 10.50 | 0.390     | 0.413 |
| E              | 5.10        | 5.45  | 0.201     | 0.215 |
| e              | 1.27 BSC    |       | 0.050 BSC |       |
| H <sub>E</sub> | 7.40        | 8.20  | 0.291     | 0.323 |
| 0.50           | 0.50        | 0.85  | 0.020     | 0.033 |
| L <sub>E</sub> | 1.10        | 1.50  | 0.043     | 0.059 |
| M              | 0 °         | 10 °  | 0 °       | 10 °  |
| Q <sub>1</sub> | 0.70        | 0.90  | 0.028     | 0.035 |
| Z              | ---         | 1.42  | ---       | 0.056 |

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