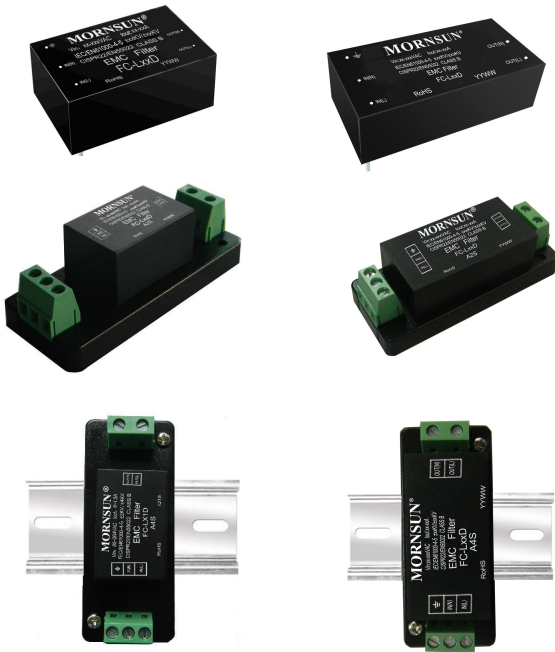


EMC Filter



FEATURES

- Universal 85-305VAC input voltage
- Ensure the power supply module to meet the requirement of CISPR22/EN55022 Class B
- Operating ambient temperature range: -40°C to +85°C
- Compact size, application of PCB mounting, Chassis mounting with Screw Terminals, DIN-Rail mounting

RoHS

This model applies to analog circuit which is noise-sensitive. Put FC-LX1D on to the input of AC/DC module can ensure the module meet Surge level of IEC/EN61000-4-5 ±2KV (2Ω internal resistance)/±4KV (12Ω internal resistance). Put FC-LX1D2 on to the input of AC/DC module can ensure the module meet Surge level of IEC/EN61000-4-5 ±4KV (2Ω internal resistance)/±6KV (12Ω internal resistance) and EMI requirement of CISPR22 /EN 55022 Class B.

EMC filter used with the MORNSUN AC/DC module, AC/DC module's max. Input voltage must not more than EMC filter's max. Voltage, AC/DC module's max. Input current must less than EMC filter's nominal current.

Selection Guide

| Model | Input Voltage Range (VAC) | Nominal Current (A) (max) |
|----------|---------------------------|---------------------------|
| FC-LX1D | 85 - 305 | 1.5 |
| FC-LX1D2 | 85 - 305 | 1.5 |

Note: Suffix of "A2S" means chassis mounting and suffix of "A4S" means DIN-Rail mounting, for example FC-LX1DA4S.

General Specifications

| Item | Test Conditions | Min. | Typ. | Max. | Unit |
|---------------------------|---|------|------|------|------|
| Operating Temperature | | -40 | -- | 85 | °C |
| Storage Temperature | | -55 | -- | 125 | |
| Casing Temperature Rise | 220VAC @0.5A | -- | -- | 5 | |
| | 220VAC @1.0A | -- | -- | 20 | |
| | 220VAC @1.5A | -- | -- | 30 | |
| Test Voltage (L/PE, N/PE) | Tested for 1 minute and leakage current: 5 mA | -- | 2000 | -- | VAC |

General Specifications

| | | | |
|--------------------|---|--------------------|----------------------|
| Casing Material | Black plastic, flame-retardant and heat-resistant (UL94V-0) | | |
| Package Dimensions | FC-LX1D | Horizontal package | 33.70x22.20x18.00 mm |
| | | A2S wiring package | 76.00x31.50x26.80 mm |
| | | A4S rail package | 76.00x31.50x31.40 mm |
| | FC-LX1D2 | Horizontal package | 53.80x28.80x19.00 mm |
| | | A2S wiring package | 76.00x31.50x27.80 mm |
| | | A4S rail package | 76.00x31.50x32.40 mm |

| | | | |
|--------|----------|--|-------------------|
| Weight | FC-LX1D | Horizontal package/A2S wiring package/ A4S rail package | 20g/40g/60g (Typ) |
| | FC-LX1D2 | | 50g/70g/90g (Typ) |

Frequency Attenuation Specifications

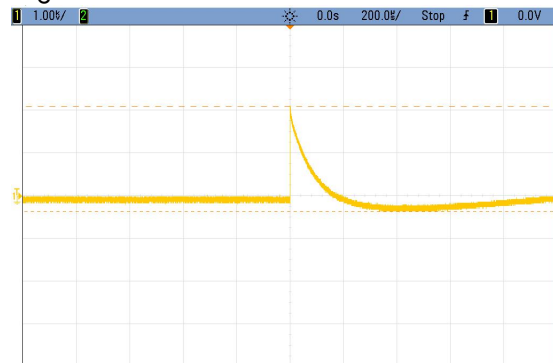
| Item | Test Conditions | Min. | Typ. | Max. | Unit | |
|--|-----------------|----------|------|------|------|----|
| The attenuation coefficient of frequency | 150KHz—1GHz | FC-LX1D | -- | 20 | -- | dB |
| | | FC-LX1D2 | -- | 30 | -- | |

Devise Standard

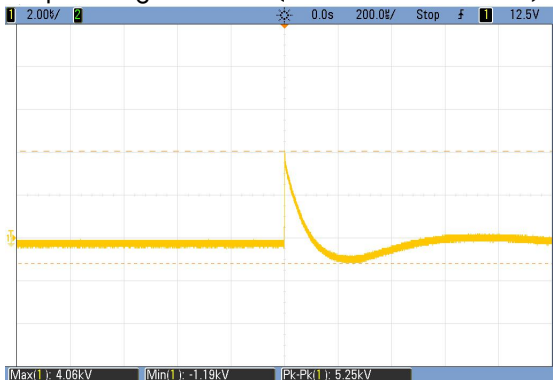
Put FC-LX1D on to the input of AC/DC module can ensure the module meet Surge level of IEC/EN61000-4-5 standard $\pm 2kV$ (2Ω internal resistance)/ $\pm 4kV$ (12Ω internal resistance). Put FC-LX1D2 on to the input of AC/DC module can ensure the module meet Surge level of IEC/EN61000-4-5 standard $\pm 4kV$ (2Ω internal resistance)/ $\pm 6kV$ (12Ω internal resistance) and EMI requirement of CISPR22 /EN 55022 Class B.

EMC Specifications

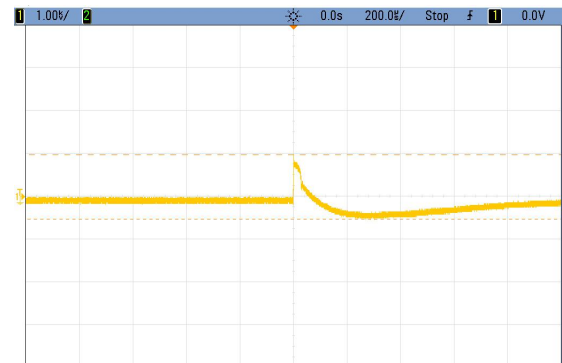
①FC-LX1D Surge Test Result



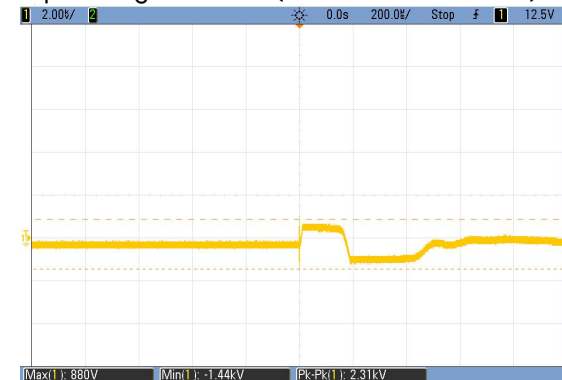
Input voltage waveform (Differential mode 2.11KV)



Input voltage waveform (Common mode 4.06KV)



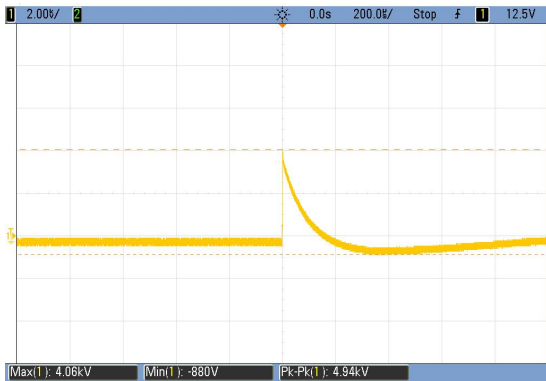
Output voltage waveform (Differential mode 0.98KV)



Output voltage waveform(Common mode 0.88 KV)

Note: Above result was tested on FC-LX1D open.

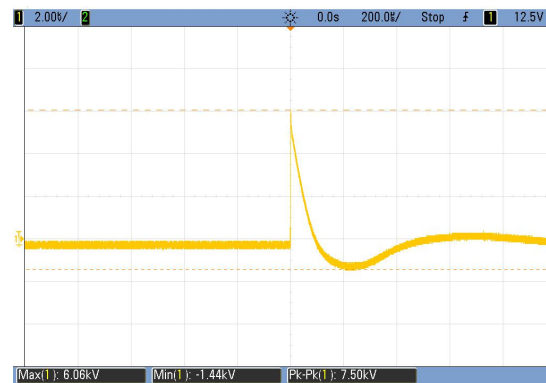
②FC-LX1D2 Surge Test Result



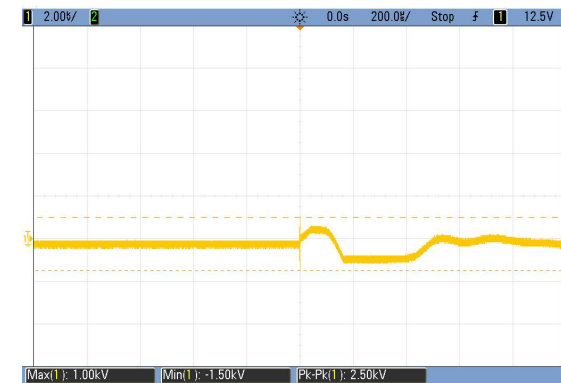
Input voltage waveform (Differential mode 4.06kV)



Output voltage waveform (Differential mode 0.90kV)



Input voltage waveform (Common mode 6.06kV)

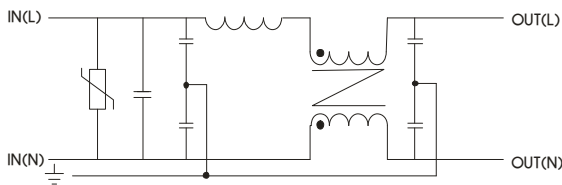


Output voltage waveform (Common mode 1.00kV)

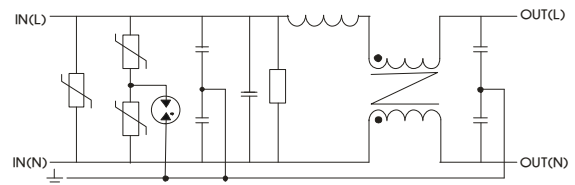
Note: Above result was tested on FC-LX1D2 open.

Design Reference

1. Inside schematic

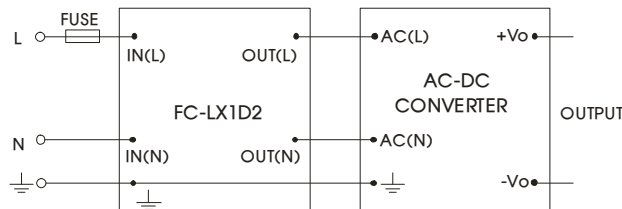


(Figure 1)FC-LX1D



(Figure 2)FC-LX1D2

2. Typical application



FUSE: Due to the difference of the power module input current, the fuse of the recommended values, please refer to the Technical Manual for the power module.

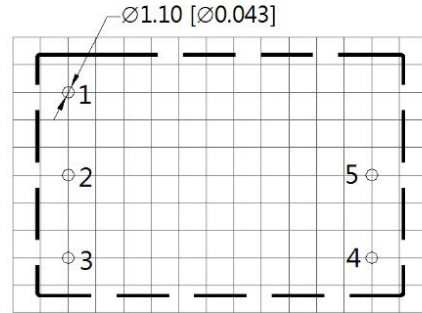
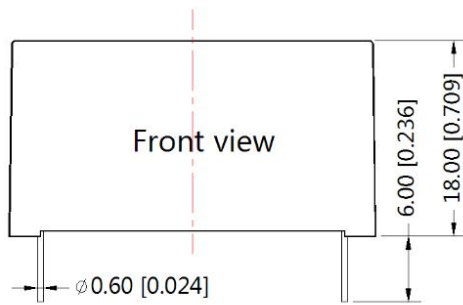
3. Supporting the power module product model

| Model | EMI (Without External Circuit) | EMI (With EMC filter) | EFT (Without External Circuit) | EFT (With EMC filter) | Surge (Without External Circuit) | Surge(With FC-LX1D) | Surge (With FC-LX1D2) |
|---|---|--------------------------------|--------------------------------------|-----------------------------|--|----------------------------------|----------------------------------|
| LD03-10BXX(A2S/A4 S) Series、 LD03-10B12R2-LM、 LD03-10B12-FY | CISPR22/ EN55022 CLASS A | CISPR22/ EN55022 CLASS B | -- | IEC/EN61000-4- 4 ±2KV | -- | IEC/EN61000- 4-5 ±1KV/±2KV | -- |
| LD05-20B05(A2S/A4 S) Series、 LD05-20B12(A2S/A4 S) Series、 LD05-20B12R3-M、 LD05-20B12R2-M、 LD05-20B09MU、 LD05-20B24 | CISPR22/ EN55022 CLASS A | CISPR22/ EN55022 CLASS B | IEC/EN61000-4- 4 ±2KV | IEC/EN61000-4- 4 ±4KV | IEC/EN61000-4- 5 ±1KV/±2KV | IEC/EN61000- 4-5 ±2KV/±4KV | -- |
| LD05-23BXXR2 Series | CISPR22/ EN55022 CLASS B | -- | IEC/EN61000-4- 4 ±2KV | IEC/EN61000-4- 4 ±4KV | IEC/EN61000-4- 5 ±1KV | IEC/EN61000- 4-5 ±2KV/±4KV | -- |
| LD10-20BXX(A2S) Series | CISPR22/ EN55022 CLASS A | CISPR22/ EN55022 CLASS B | IEC/EN61000-4- 4 ±2KV | IEC/EN61000-4- 4 ±4KV | IEC/EN61000-4- 5 ±1KV | IEC/EN61000- 4-5 ±2KV/±4KV | -- |
| LD10-23BXX Series | CISPR22/ EN55022 CLASS B | -- | IEC/EN61000-4- 4 ±2KV | IEC/EN61000-4- 4 ±4KV | IEC/EN61000-4- 5 ±1KV | IEC/EN61000- 4-5 ±2KV/±4KV | -- |
| LD12-20BXX(A2S/A4 S) Series | CISPR22/ EN55022 CLASS B | -- | IEC/EN61000-4- 4 ±4KV | -- | IEC/EN61000-4- 5 ±2KV | -- | IEC/EN6100 0-4-5 ±4KV/±6KV |
| LD20-10BXX((A2S/A4 S) Series、 LD20-10BX5 | CISPR22/ EN55022 CLASS B | -- | IEC/EN61000-4- 4 ±4KV | -- | IEC/EN61000-4- 5 ±2KV | -- | IEC/EN6100 0-4-5 ±4KV/±6KV |
| LH Series | CISPR22/ EN55022 CLASS B | -- | IEC/EN61000-4- 4 ±2KV | IEC/EN61000-4- 4 ±4KV | IEC/EN61000-4- 5 ±1KV/±2KV | IEC/EN61000- 4-5 ±2KV/±4KV | -- |
| Power Converter For Power System LH(ER2) Series | CISPR22/ EN55022 CLASS A | CISPR22/ EN55022 CLASS B | IEC/EN61000-4- 4 ±4KV | -- | IEC/EN61000-4- 5 ±2KV/±4KV | -- | EC/EN61000 -4-5 ±4KV/±6KV |
| LM30-00J0512-03E | CISPR22/ EN55022 CLASS B | -- | IEC/EN61000-4- 4 ±4KV | -- | IEC/EN61000-4- 5 ±2KV/±4KV | -- | EC/EN61000 -4-5 ±4KV/±6KV |
| LD-R2 Series | CISPR22/ EN55022 CLASS B | -- | IEC/EN61000-4- 4 ±4KV | -- | IEC/EN61000-4- 5 ±2KV/±4KV | IEC/EN61000- 4-5 ±2KV/±4KV | -- |

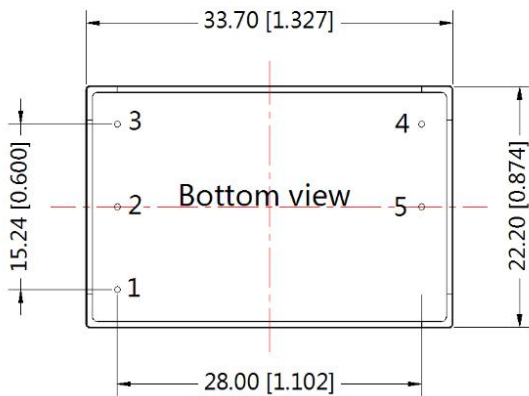
4. For additional information please refer to application notes on www.mornsun-power.com

FC-LX1D Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

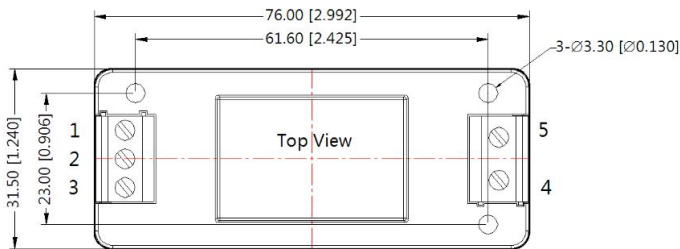


Note:
Unit: mm[inch]
Pin diameter tolerances: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.50[\pm 0.020]$

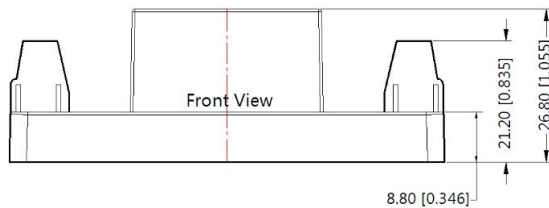
| Pin-Out | |
|---------|----------|
| Pin | Function |
| 1 | |
| 2 | IN(N) |
| 3 | IN(L) |
| 4 | OUT(L) |
| 5 | OUT(N) |

FC-LX1DA2S Dimensions

THIRD ANGLE PROJECTION



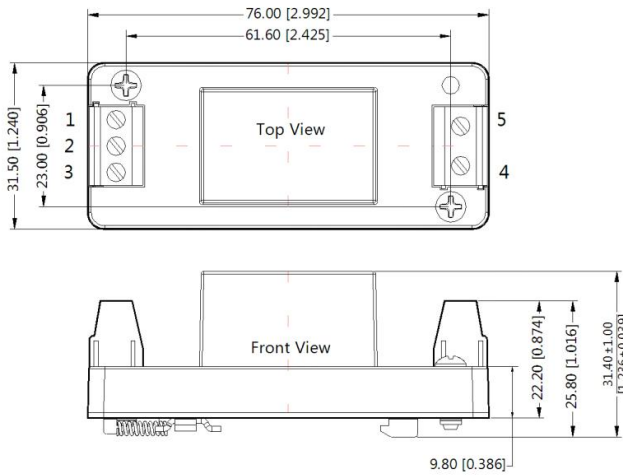
| Pin-Out | | | | | |
|------------|---|-------|-------|--------|--------|
| Pin | 1 | 2 | 3 | 4 | 5 |
| Connection | | IN(N) | IN(L) | OUT(L) | OUT(N) |



Note:
Unit: mm[inch]
Wire range: 24~12 AWG
General tolerances: $\pm 0.50[\pm 0.020]$

FC-LX1DA4S Dimensions

THIRD ANGLE PROJECTION

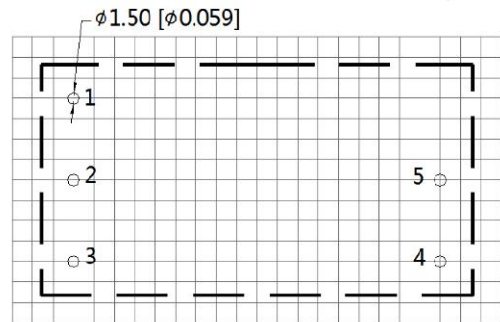
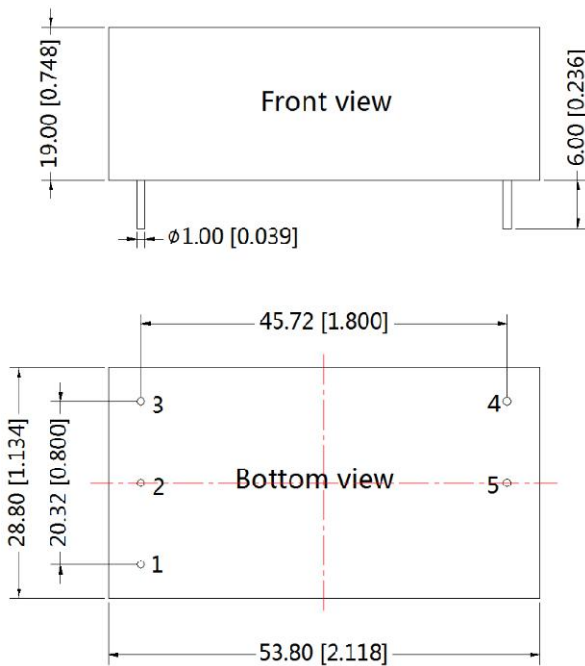


| Pin-Out | | | | | |
|----------|---------|-------|-------|--------|--------|
| Pin | 1 | 2 | 3 | 4 | 5 |
| Function | \perp | IN(N) | IN(L) | OUT(L) | OUT(N) |

Note:
Unit: mm[inch]
Wire range: 24~12 AWG
General tolerances: ±0.50[±0.020]

FC-LX1D2 Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



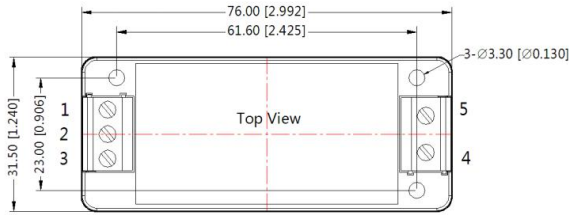
Note: Grid 2.54*2.54mm

| Pin-Out | |
|---------|----------|
| Pin | Function |
| 1 | \perp |
| 2 | IN(N) |
| 3 | IN(L) |
| 4 | OUT(L) |
| 5 | OUT(N) |

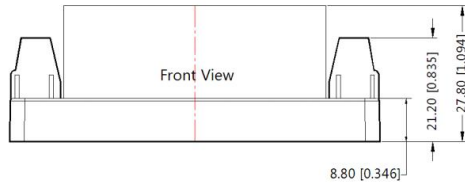
Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]

FC-LX1D2A2S Dimensions

THIRD ANGLE PROJECTION



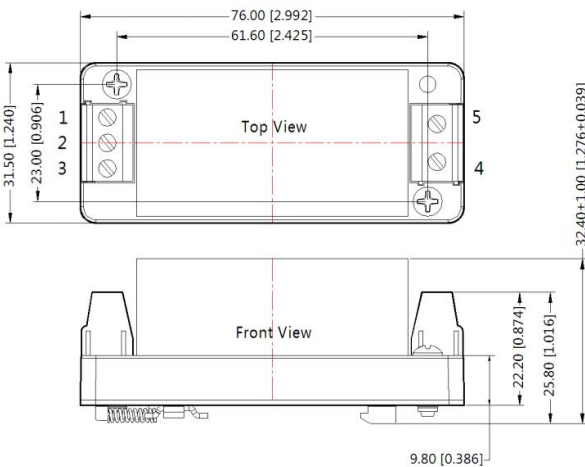
| Pin-Out | | | | | |
|----------|---------|-------|-------|--------|--------|
| Pin | 1 | 2 | 3 | 4 | 5 |
| Function | \perp | IN(N) | IN(L) | OUT(L) | OUT(N) |



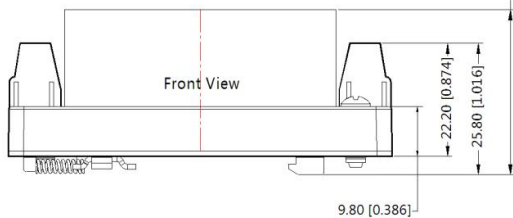
Note:
Unit: mm[inch]
Wire range: 24~12 AWG
General tolerances: $\pm 0.50[\pm 0.020]$

FC-LX1D2A4S Dimensions

THIRD ANGLE PROJECTION



| Pin-Out | | | | | |
|----------|---------|-------|-------|--------|--------|
| Pin | 1 | 2 | 3 | 4 | 5 |
| Function | \perp | IN(N) | IN(L) | OUT(L) | OUT(N) |



Note:
Unit: mm[inch]
Wire range: 24~12 AWG
General tolerances: $\pm 0.50[\pm 0.020]$

- Note:
1. Packing Information please refer to 'Product Packing Information'. The Packing bag number of Horizontal package : 58200055 (FC-LX1D)/58220005(FC-LX1D2), the Packing bag number of A2S/ A4S package:58220022;
 2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
 3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ\text{C}$, humidity<75% with nominal input voltage and rated output load;
 4. All index testing methods in this datasheet are based on our company corporate standards;
 5. We can provide product customization service, please contact our technicians directly for specific information;
 6. Products are related to laws and regulations: see "Features" and "EMC";
 7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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