

EMC Filter



FEATURES

- Compact size
- Design to suppress the AC power surge to achieve primary protection
- Ensure the power supply module to meet the requirement of CISPR22/EN55022 Class B
- Cost-effective
- Low Temperature rise
- Mounting: 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 less 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: series with suffix "A2S" are chassis mounting, with suffix "A4S" are DIN-Rail mounting, for example FC-LX1DA4S.

General Specifications

Item	Test Conditions	Min.	Typ.	Max.	Unit
Operating Temperature		-40	--	85	℃
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: 1 mA	--	2000	--	VAC

General Specifications

Casing Material		Black flame-retardant heat-proof epoxy resin (UL94-V0)	
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
		A2 Swiring package	76.00x31.50x27.80 mm
		A4S rail package	76.00x31.50x32.40mm

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

Frequency Attenuation Specifications

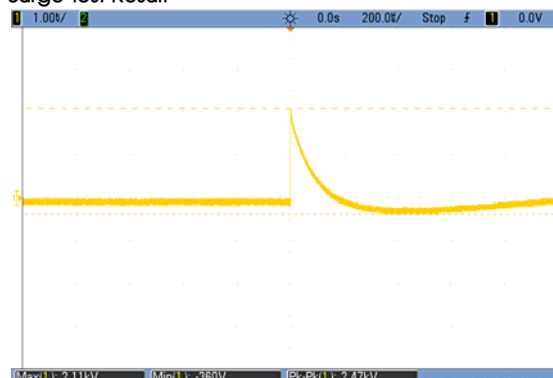
Item	Test Conditions	Min.	Typ.	Max.	Unit	
The attenuation coefficient of frequency	150KHz—1GHz	FC-LX1D	--	20	--	dB
		FC-LX1D2	--	30	--	

Devise Standard

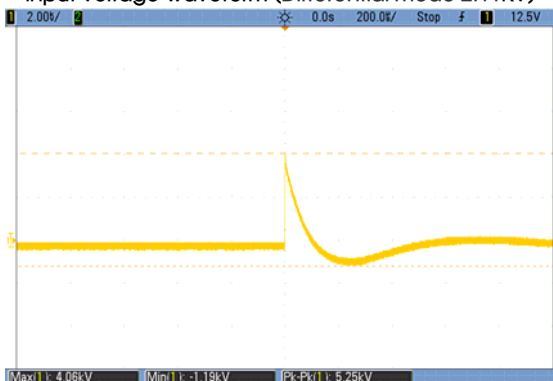
Put FC-LX1D on to the input of AC/DC module can ensure the module meet Surge level of IEC/EN61000-4-5 ±2KV (2Ω internal resistance)/±4KV (12Ω internal resistance). Put FC-LX1D2 on to the input of AC/DC module can ensure the module meet Surge level of IEC/EN61000-4-5 ±4KV (2Ω internal resistance)/±6KV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

EMC Specifications

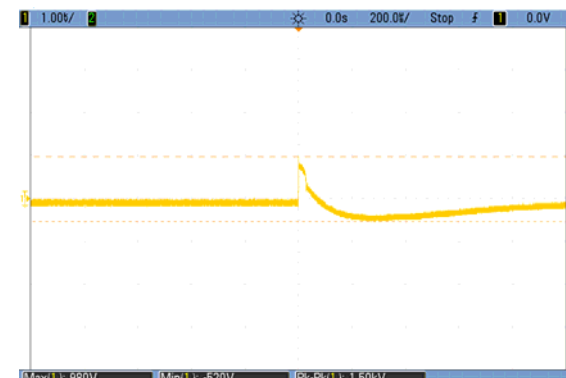
①FC-LX1D Surge Test Result



Input voltage waveform (Differential mode 2.11kV)



Input voltage waveform (Common mode 4.06kV)



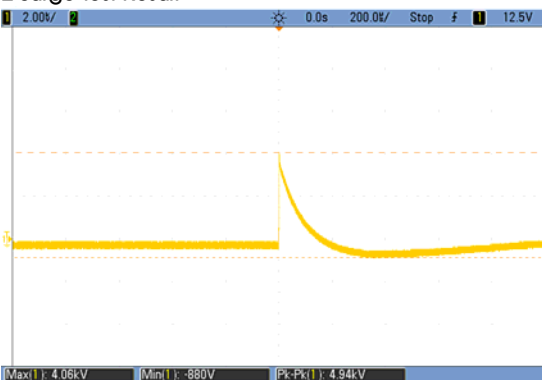
Output voltage waveform (Differential mode 0.98kV)



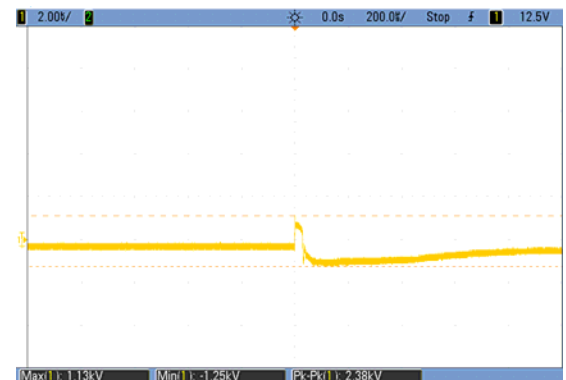
Output voltage waveform (Common mode 0.88 kV)

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

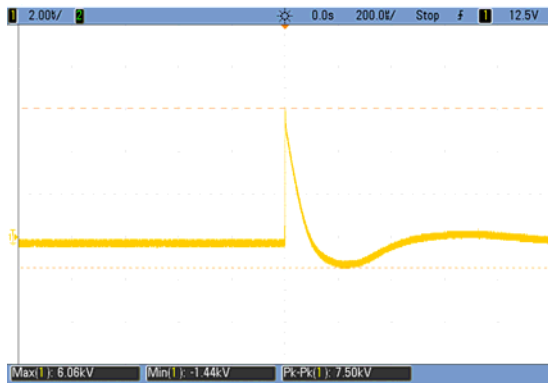
②FC-LX1D2 Surge Test Result



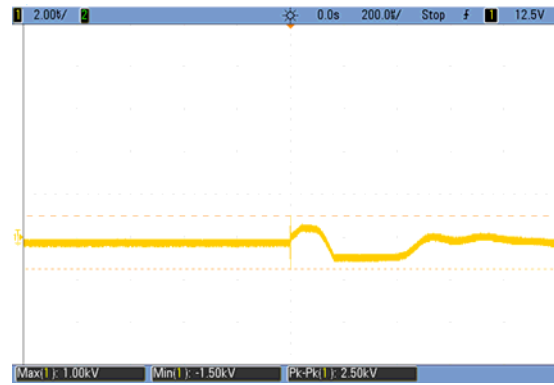
Input voltage waveform (Differential mode 4.06kV)



Output voltage waveform (Differential mode 0.90kV)



Input voltage waveform (Common mode 6.06KV)

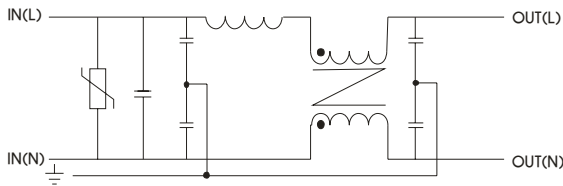


Output voltage waveform(Common mode 1.00KV)

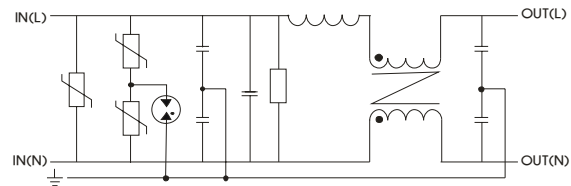
Note: Above result was tested on FC-LX1D2 open.

Design Reference

1. Inside schematic

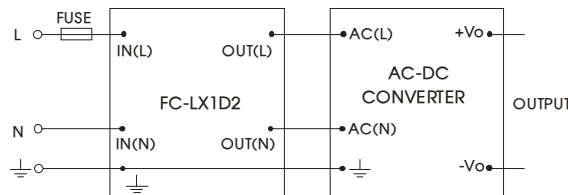


(Figure 1)FC-LX1D



(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.

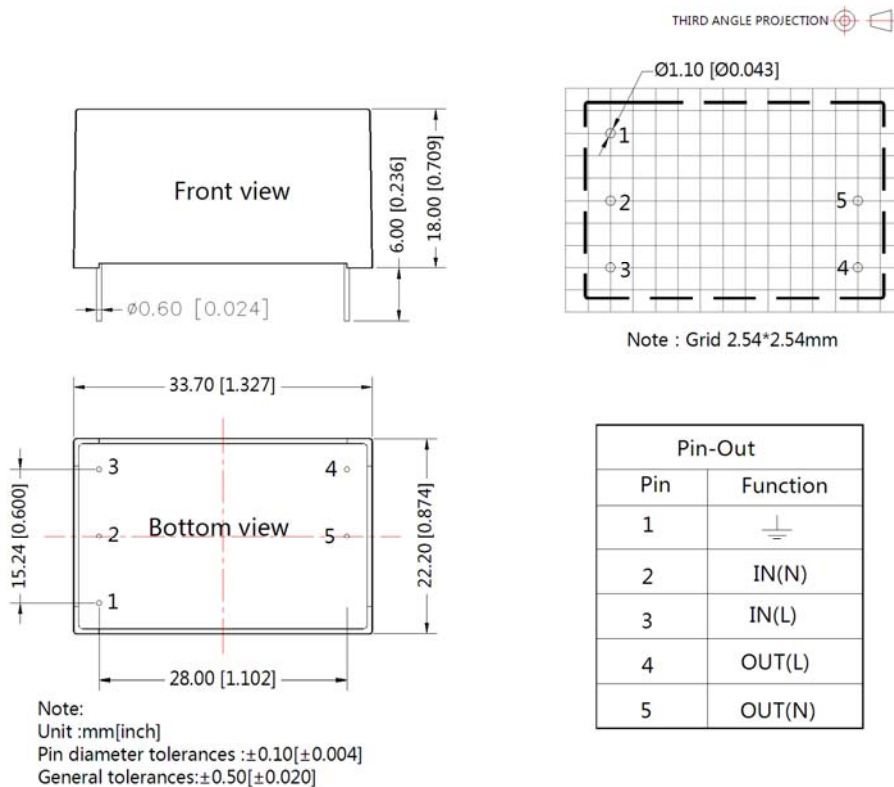
3. Supporting the product model

Model	EMI (Without External Circuit)	EMI (With EMC filter)	Surge (Without External Circuit)	Surge (With FC-LX1D)	Surge (With FC-LX1D2)
LD(01-03)-10BXX Series	CISPR22/EN55022 CLASS A	CISPR22/EN55022 CLASS B	--	IEC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	--
LD(05-10)-20BXX Series	CISPR22/EN55022CLASS A	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±1KV perf. Criteria B	IEC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	IEC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LD10-20BXXMU Series	CISPR22/EN55022CLASS A	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±1KV perf. Criteria B	EC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	IEC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LD12-20BXX Series	CISPR22/EN55022 CLASS B	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±2KV perf. Criteria B	--	IEC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LD20-10BXX Series	CISPR22/EN55022 CLASS B	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±2KV/±4KV perf. Criteria B	--	IEC/EN61000-4-5 ±4KV/±6KV perf. Criteria B

Model	EMI (Without External Circuit)	EMI (With EMC filter)	Surge (Without External Circuit)	Surge (With FC-LX1D)	Surge (With FC-LX1D2)
LH(05-40)-10XXX Series	CISPR22/EN55022 CLASS B	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±1KV/±2KV perf. Criteria B	IEC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	IEC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LBXX-10XXX Series	CISPR22/EN55022 CLASS A	CISPR22/EN55022 CLASS B	IEC/EN61000-4-5 ±1KV/±2KV perf. Criteria B	IEC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	IEC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LI 24 Series	CISPR22/EN55022 CLASS B	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±1KV/±2KV perf. Criteria B	IEC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	EC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LS03 Series	--	CISPR22/EN55022 CLASS B	--	EC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	--
Dedicated Power Converter For Power System LH(E) Series	CISPR22/EN55022 CLASS B	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±2KV/±4KV perf. Criteria B	--	EC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
Dedicated Power Converter For Power System LH(ER2) Series	CISPR22/EN55022 CLASS A	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±2KV/±4KV perf. Criteria B	--	EC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LM30-00J0512-03E	CISPR22/EN55022 CLASS B	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±2KV/±4KV perf. Criteria B	--	EC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LO10-00B24E	CISPR22/EN55022 CLASS B	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 2KV/4KV perf. Criteria B	--	EC/EN61000-4-5 ±4KV/±6KV perf. Criteria B

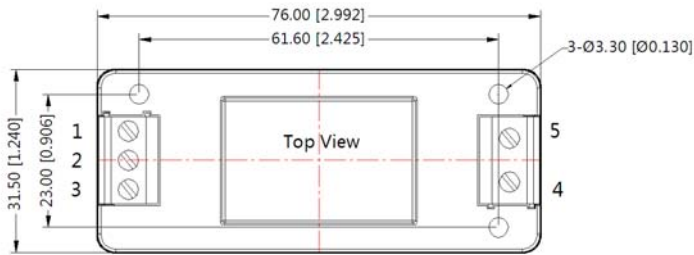
4. For more information Please find the application notes on www.mornsun-power.com


FC-LX1D Dimensions and Recommended Layout

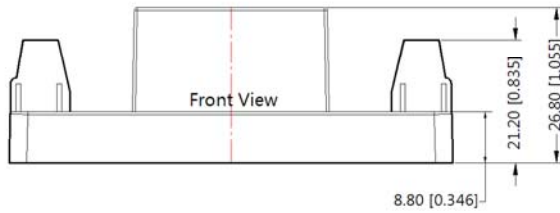


FC-LX1DA2S Dimensions

THIRD ANGLE PROJECTION 



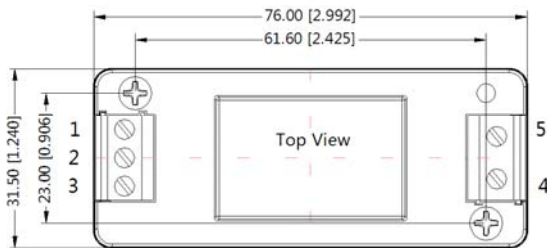
Pin-Out					
Pin	1	2	3	4	5
Connection		IN(N)	IN(L)	OUT(L)	OUT(N)




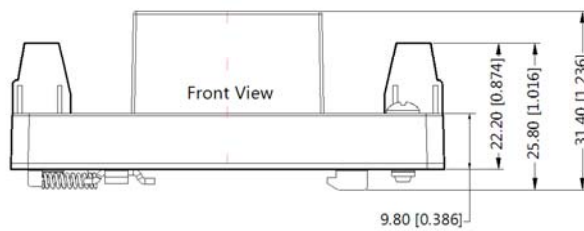
Note:
Unit:mm[inch]
Wire range:24~12 AWG
General tolerances:±0.50[±0.020]

FC-LX1DA4S Dimensions

THIRD ANGLE PROJECTION 

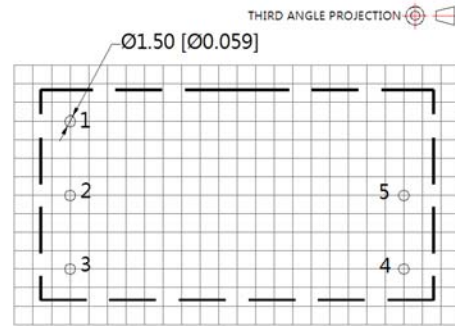
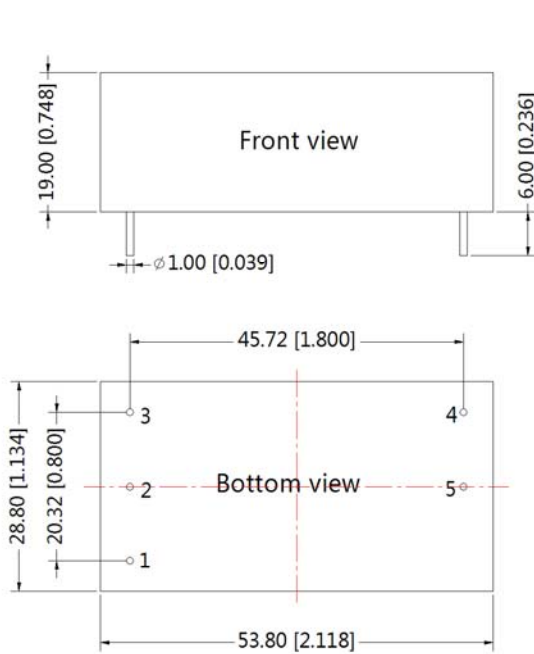


Pin-Out					
Pin	1	2	3	4	5
Connection		IN(N)	IN(L)	OUT(L)	OUT(N)



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

FC-LX1D2 Dimensions and Recommended Layout

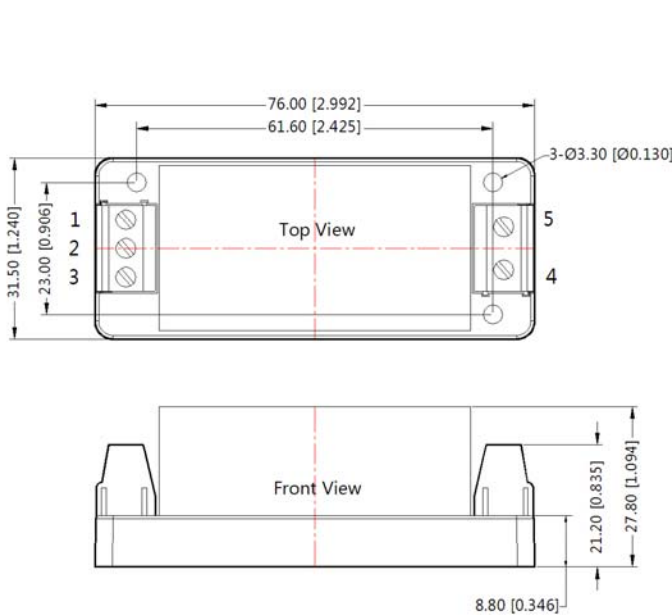


Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	
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: ± 0.25 [± 0.010]

FC-LX1D2A2S Dimensions



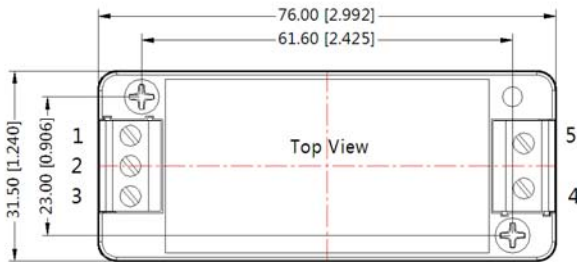
THIRD ANGLE PROJECTION


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

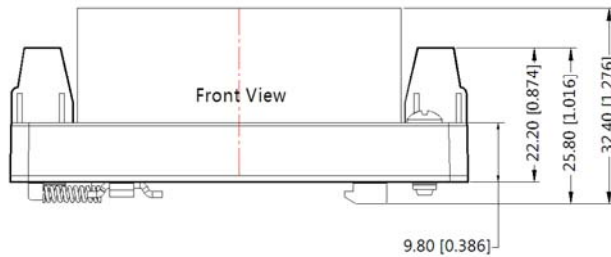
Note:
Unit:mm[inch]
Wire range:24~12 AWG
General tolerances: ± 0.50 [± 0.020]

FC-LX1D2A4S 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:±0.50[±0.020]

Note:

1. Packing Information please refer to 'Product Packing Information'. The Packing bag number of Horizontal package : 58220014 (FC-LX1D)/58220005(FC-LX1D2), the Packing bag number of A2S/ A4S package:58220022;
2. Unless otherwise specified, data in this data sheet should be tested under the conditions of Ta=25°C, humidity<75%;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.

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