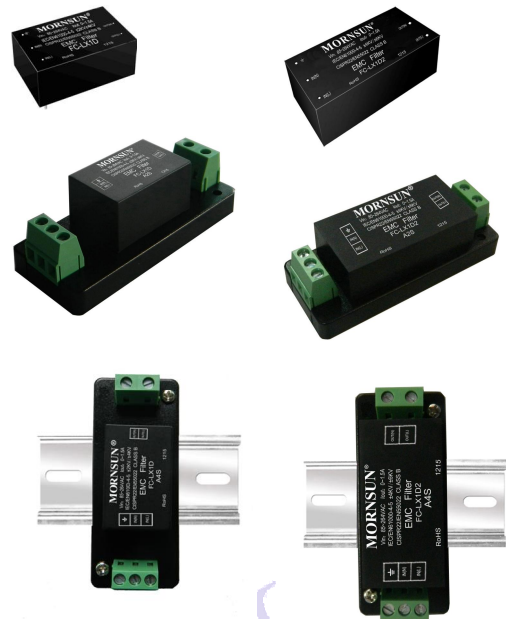


MORNSUN®

FC-LX1D & FC-LX1D2 EMC Filter

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.

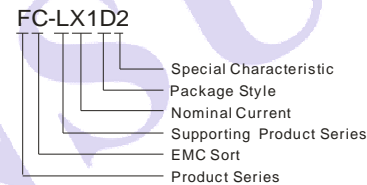


RoHS

FEATURES

1. Compact size
2. Design to suppress the AC power surge to achieve primary protection
3. Ensure the power supply module to meet the requirement of CISPR22/EN55022 Class B
4. Cost-effective
5. Low Temperature rise
6. Mounting: PCB mounting, Chassis mounting with Screw Terminals, DIN-Rail mounting

PART NUMBER SYSTEM



SELECTION GUIDE

Model	Input Voltage Range (VAC)	Nominal Current (A)(max)
FC-LX1D	85~264	1.5
FC-LX1D2	85~264	1.5

Note: series with suffix "A2S" are chassis mounting, with suffix "A4S" are DIN-Rail mounting, for example FC-LX1DA4S.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Operating Temperature		-40	--	85	°C
Storage Temperature		-55	--	125	
Case 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
Case Material		Plastic (UL94-V0)			
Package	FC-LX1D	PCB mounting	33.7x22.2x18.00		mm
		A2S Chassis mounting with Screw Terminals	76.0x31.5x26.80		
		A4S DIN-Rail mounting	76.0x31.5x31.40		
	FC-LX1D2	PCB mounting	53.8x28.8x19.00		
		A2S Chassis mounting with Screw Terminals	76.0x31.5x27.80		
		A4S DIN-Rail mounting	76.0x31.5x32.40		
Weight	FC-LX1D	PCB mounting	20		g
		A2S Chassis mounting with Screw Terminals	40		
		A4S DIN-Rail mounting	60		
	FC-LX1D2	PCB mounting	50		

	A2S Chassis mounting with Screw Terminals	70
	A4S DIN-Rail mounting	90

Note: All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.

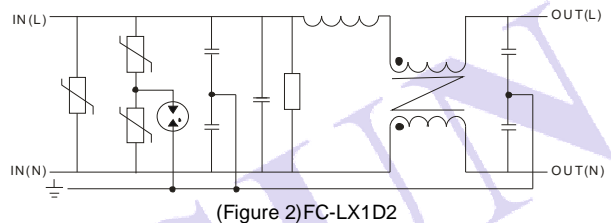
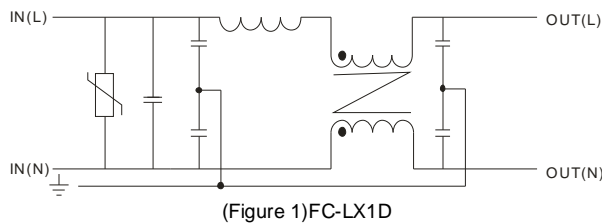
FREQUENCY ATTENUATION SPECIFICATIONS

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

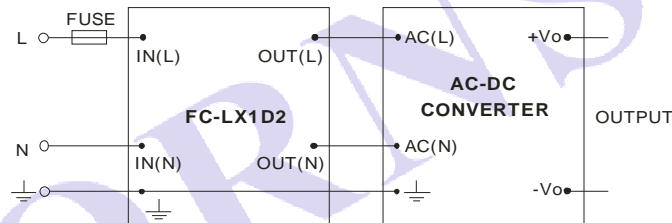
DEVISE STANDARD

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.

INSIDE SCHEMATIC



APPLY CIRCUIT



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.

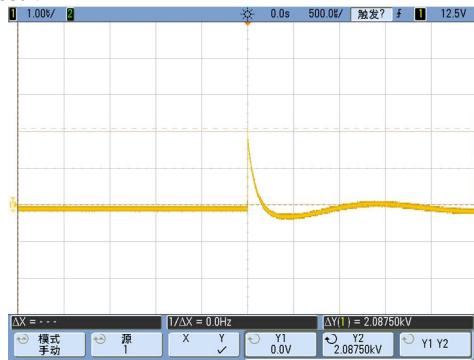
SUPPORTING THE PRODUCT MODEL

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/EN55022CLAS S 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/EN55022CLAS S 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
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

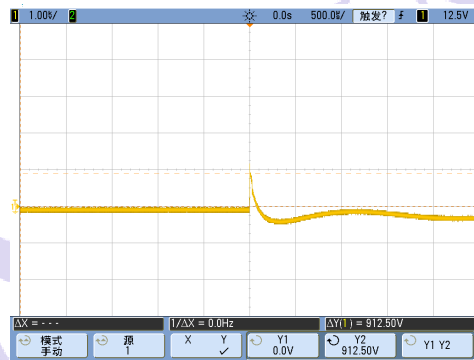
LI 24 Series	CISPR22/EN55022 CLASS B	CISPR22/EN55022 CLASS B	IEC/EN 61000-4-5 ±1KV/±2KV perf. Criteria B	IEC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	EC/EN61000-4-5 ±4KV/±6KV perf. Criteria B
LS03 Series	--	CISPR22/EN55022 CLASS B	--	EC/EN61000-4-5 ±2KV/±4KV perf. Criteria B	--
Dedicated Power Converter 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
LM30-00J0512-03 E	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

FC-LX1D EMC SPECIFICATIONS

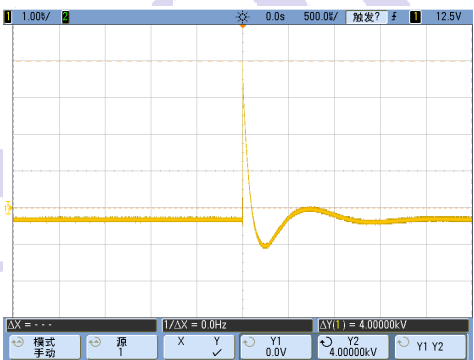
① Surge Test Result



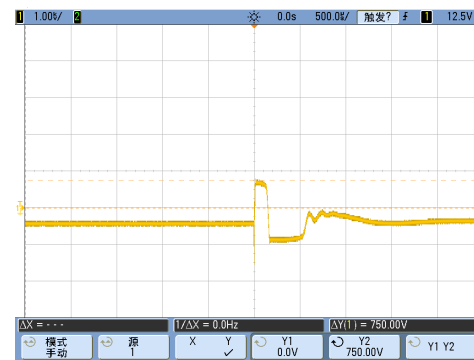
Input voltage waveform (Differential mode 2.08KV)



Output voltage waveform (Differential mode 0.91 KV)



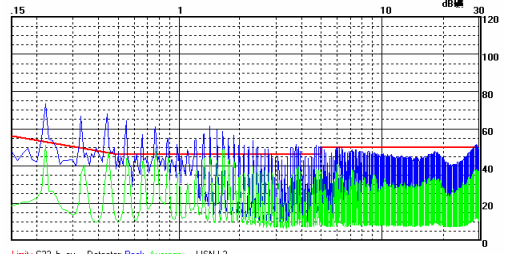
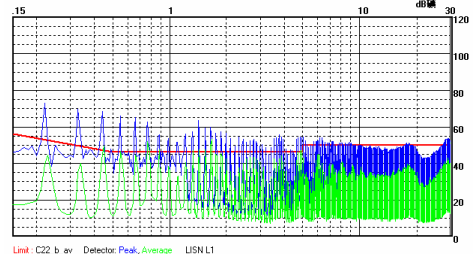
Input voltage waveform (Common mode 4.00KV)



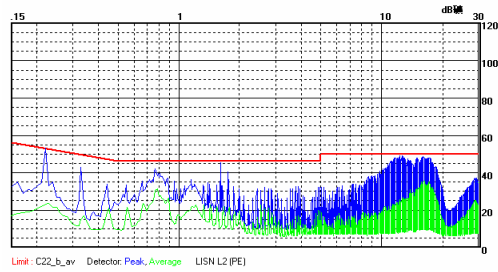
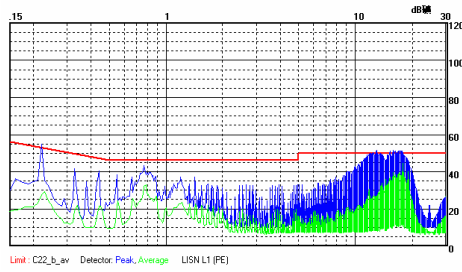
Output voltage waveform (Common mode 0.75 KV)

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

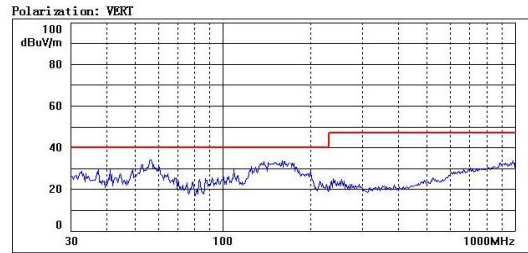
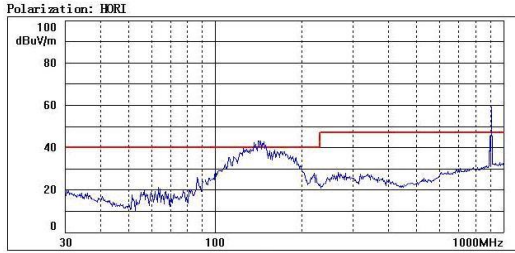
② EMI TEST WAVEFORM



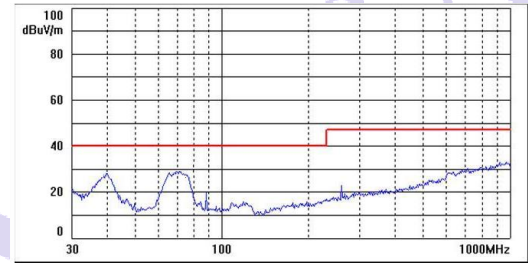
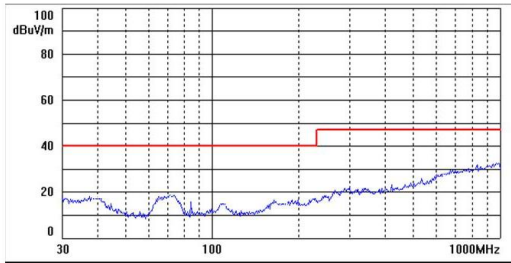
Power supply front-end without FC-LX1D L1 (left), L2(right)line CE meet CISPR22/EN 55022 Class A



Power supply front-end with FC-LX1D L1(left), L2(right) line CE meet CISPR22/EN 55022 Class B



Power supply front-end without FC-LX1D Horizontal (left), Vertical(right) RE meet CISPR22/EN 55022 Class A

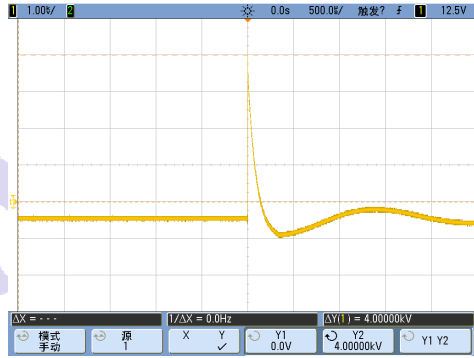


Power supply front-end with FC-LX1D Horizontal (left), Vertical(right) RE meet CISPR22/EN 55022 Class B

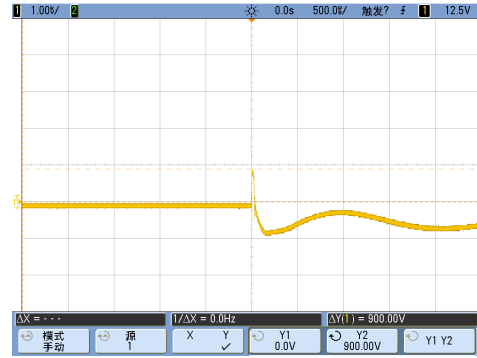
Note: Above result was tested on LD03-10B05.

FC-LX1D2 EMC SPECIFICATIONS

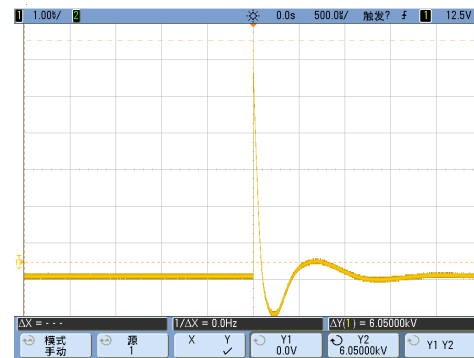
① Surge Test Result



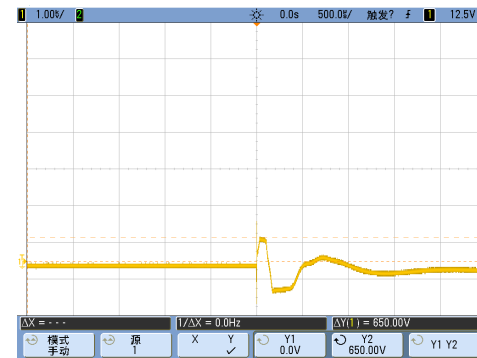
Input voltage waveform (Differential mode 4.00KV)



Output voltage waveform (Differential mode 0.90KV)



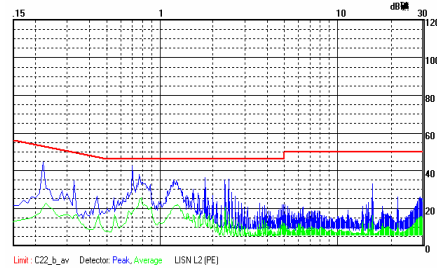
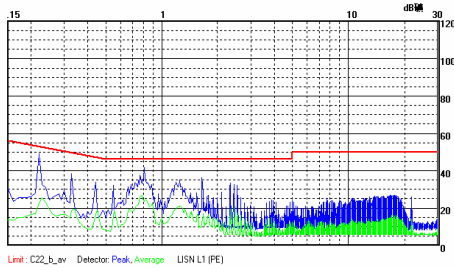
Input voltage waveform (Common mode 6.05KV)



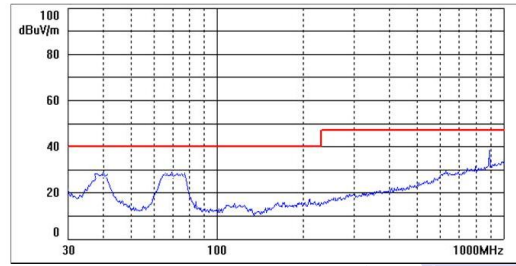
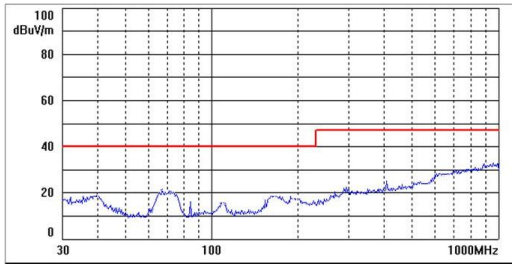
Output voltage waveform (Common mode 0.65KV)

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

② EMI TEST WAVEFORM



Power supply front-end with FC-LX1D2 L1(left), L2(right) line CE meet CISPR22/EN 55022 Class B



Power supply front-end with FC-LX1D2 Horizontal (left), Vertical(right) RE meet CISPR22/EN 55022 Class B

Note: Above result was tested on LD03-10B05.

FC-LX1D PCB MOUNTING WITH SOLDER PINS

MECHANICAL DIMENSIONS

PIN CONNECTION	
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:±0.50[±0.020]

THIRD ANGLE PROJECTION

RECOMMENDED FOOTPRINT DETAILS

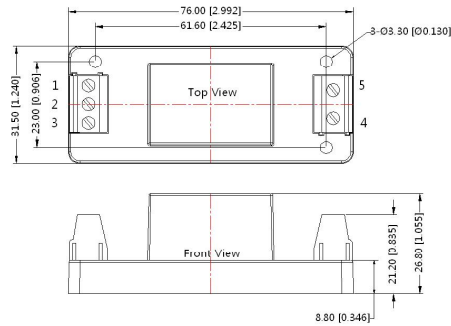
Note : Grid 2.54*2.54mm

TUBE PACKAGING DIMENSIONS

Note:
General tolerances: ± 0.50mm[± 0.020inch]
L=220mm[8.661inch] Tube Quantity: 8pcs
L=530mm[20.866inch] Tube Quantity: 22pcs
Inner carton(S): L*W*H=255*170*80mm
Outer carton(S): L*W*H=375*280*270mm,6 inner cartons(S)
Inner carton(L): L*W*H=580*200*100mm
Outer carton(L): L*W*H=600*215*220mm,2 inner cartons(L)
Outer carton(L): L*W*H=600*215*325mm,3 inner cartons(L)

FC-LX1DA2S CHASSIS MOUNTING WITH SCREW TERMINALS

MECHANICAL DIMENSIONS

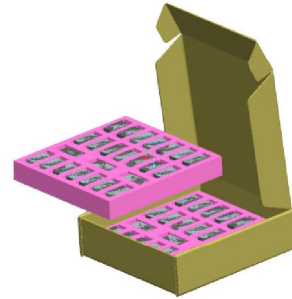


Pin connection					
Pin	1	2	3	4	5
Connection	\perp	IN(N)	IN(L)	OUT(L)	OUT(N)

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



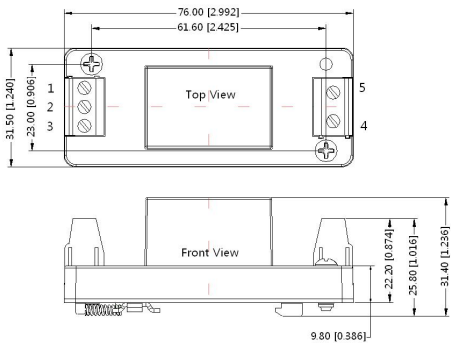
PACKAGE DIAGRAM



Note:
 Inner carton dimensions L*W*H=365*350*105mm
 Packaging quantity : 48 PCS
 Outer carton dimensions: L*W*H=390*360*245mm
 Packaging quantity : 96 PCS

FC-LX1DA4S DIN-RAIL MOUNTING

MECHANICAL DIMENSIONS

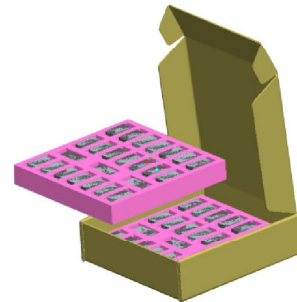


Pin connection					
Pin	1	2	3	4	5
Connection	\perp	IN(N)	IN(L)	OUT(L)	OUT(N)

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



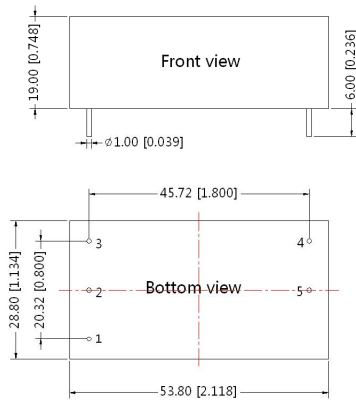
PACKAGE DIAGRAM



Note:
 Inner carton dimensions L*W*H=365*350*105mm
 Packaging quantity : 48 PCS
 Outer carton dimensions: L*W*H=390*360*245mm
 Packaging quantity : 96 PCS

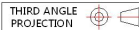
FC-LX1D2 PCB MOUNTING WITH SOLDER PINS

MECHANICAL DIMENSIONS

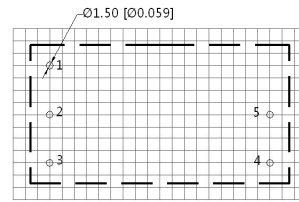


PIN CONNECTION	
Pin	Function
1	
2	IN(N)
3	IN(L)
4	OUT(L)
5	OUT(N)

Note:
 Unit :mm[inch]
 Pin diameter tolerances : $\pm 0.10[\pm 0.004]$
 General tolerances: $\pm 0.25[\pm 0.010]$

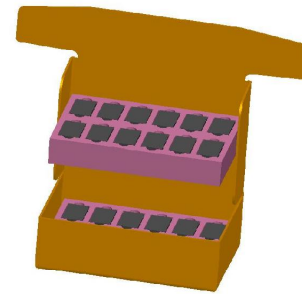


RECOMMENDED FOOTPRINT DETAILS



Note : Grid 2.54*2.54mm

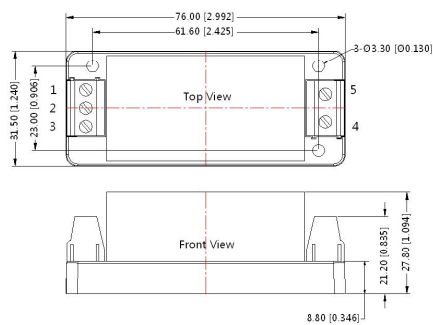
PACKAGE DIAGRAM



Note:
 Inner carton : L*W*H=255*170*80 mm
 Packaging quantity: 24pcs
 Outer carton : L*W*H=405*380*305 mm
 Packaging quantity: 144pcs

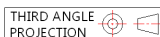
FC-LX1D2A2S CHASSIS MOUNTING WITH SCREW TERMINALS

MECHANICAL DIMENSIONS

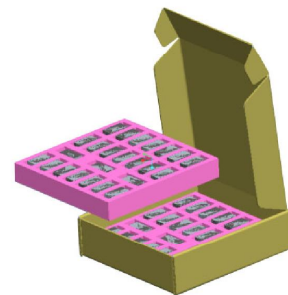


Pin connection					
Pin	1	2	3	4	5
Connection		IN(N)	IN(L)	OUT(L)	OUT(N)

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



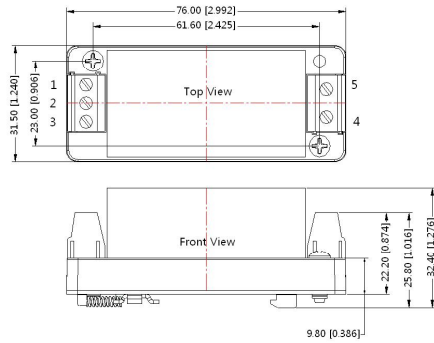
PACKAGE DIAGRAM



Note:
 Inner carton dimensions L*W*H=365*350*105mm
 Packaging quantity : 48 PCS
 Outer carton dimensions: L*W*H=390*360*245mm
 Packaging quantity : 96 PCS

FC-LX1D2A4S DIN-RAIL MOUNTING

MECHANICAL DIMENSIONS



Pin connection					
Pin	1	2	3	4	5
Connection	\perp	IN(N)	IN(L)	OUT(I)	OUT(N)

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



PACKAGE DIAGRAM



Note:
 Inner carton dimensions L*W*H=365*350*105mm
 Packaging quantity : 48 PCS
 Outer carton dimensions: L*W*H=390*360*245mm
 Packaging quantity : 96 PCS

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