

EMC Filter



Patent Protection RoHS

FEATURES

- Designed to meet IEC/EN61000-4 and CISPR32/EN55032 standards
- Meets EN50155 requirements for railway applications
- Input reverse voltage protection
- High efficiency up to 98%
- Flexible mounting options include direct PCB mounting, chassis or Din-Rail mounting with screw terminals

These filter modules are extremely useful in noise-sensitive analog circuit applications. FC-CxxD filters connected on the input side of DC/DC converters can ensure system compliance with EMC requirements according to EN50155 railway standard. MORNSUN's DC/DC railway converter module rated up to 20W can be used with the FC-CXXD filters as long as the DC-DC converters input voltage does not exceed the FC-CXXD's maximum voltage rating.

Selection Guide

Model	Input Voltage Range (VDC)	Max. output power(W)
FC-C01D	40-160	10
FC-CX1D	40-160	30
FC-C03D	40-160	50

Note: Add suffix "A2S" for chassis mounting (for example FC-C01DA2S) and suffix "A4S" for DIN-Rail mounting (for example FC-C01DA4S).

Input Specifications

Item	Test Conditions	Min.	Typ.	Max.	Unit	
Input Voltage	Operating temperature range	40	110	160	VDC	
No-load Current	FC-C01D & FC-CX1D	110VDC @ No-load	--	--	1	mA
	FC-C03D		--	--	3	

Output Specifications

Item	Test Conditions	Min.	Typ.	Max.	Unit
Efficiency	FC-C01D	110VDC @10W	--	98	%
	FC-CX1D	110VDC @30W	--	98	
	FC-C03D	110VDC @50W	--	98	
Max. Output Voltage Limit*	Input voltage less than 175V	--	165	--	VDC

Note: * Continuous operation of the filters at their Max. Output Voltage Limit may cause failures and/or permanent damage.

General Specifications

Item	Test Conditions	Min.	Typ.	Max.	Unit	
Operating Temperature		-40	--	+85	°C	
Storage Temperature		-55	--	+125		
Case Temperature Rise	110VDC @Full load, Ta=25°C	--	+25	--		
Storage Humidity		5	--	95	%RH	
Isolation	+Vin - $\frac{1}{1}$, -Vin - $\frac{1}{1}$, leakage current < 5mA, with the test time of 1 minute	FC-C03D	--	--	2000	VAC
		Others	--	--	1500	
MTBF	MIL-HDBK-217F@40°C	--	1200	--	K hours	
Vibration		IEC61373-Category 1, Grade B				

Mechanical Specifications

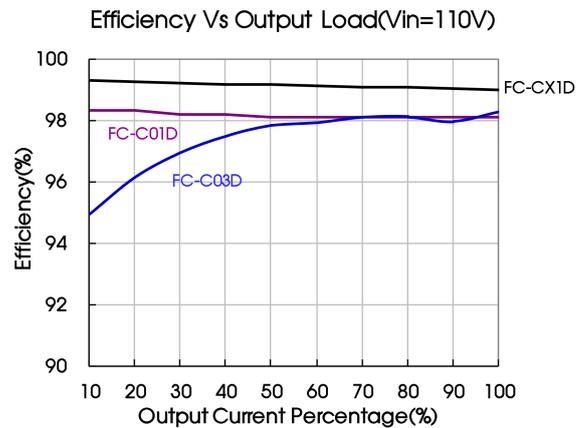
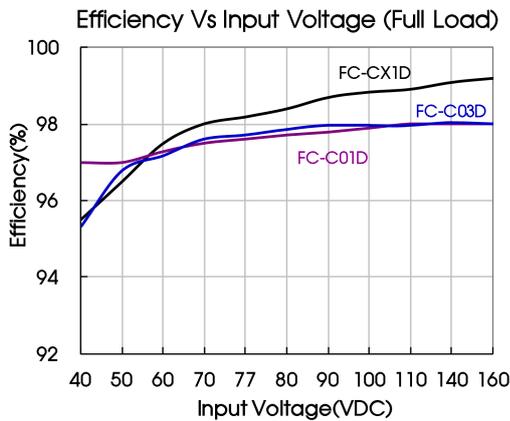
Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)		
Dimensions	FC-C01D	Horizontal package	50.80 x 25.40 x 15.16mm
		A2S chassis mounting	76.00 x 31.50 x 23.96mm
		A4S DIN-rail mounting	76.00 x 31.50 x 28.56mm
	FC-CX1D & FC-C03D	Horizontal package	53.80 x 28.80 x 19.00mm
		A2S chassis mounting	76.00 x 31.50 x 27.80mm
		A4S DIN-rail mounting	76.00 x 31.50 x 32.40mm
Weight	FC-C01D	Horizontal package/A2S chassis mounting/A4S	35.0g/55.0g/75.0g(Typ)
	FC-CX1D & FC-C03D	DIN-rail mounting	50.0g/70.0g/90.0g(Typ)

Electromagnetic compatibility (EMC)

Emissions	CE	CISPR32/EN55032	150KHz-30MHz Class B (With MORNSUN's Module)
	RE	CISPR32/EN55032	30MHz-1GHz Class B (With MORNSUN's Module)
Immunity	ESD	IEC/EN61000-4-2, GB/T17626.2	Contact ±6KV/Air ±8KV perf. Criteria B
	RS	IEC/EN61000-4-3, GB/T17626.3	10V/m (With MORNSUN's Module) perf. Criteria A
	EFT	IEC/EN61000-4-4, GB/T17626.4	±4KV (5KHz,100KHz) perf. Criteria B
	Surge	IEC/EN61000-4-5, GB/T17626.5	±2KV(1.2µs/50µs 2Ω)/±4KV(1.2µs/50µs 12Ω) perf. Criteria B
	CS	IEC/EN61000-4-6, GB/T17626.6	10Vr.m.s (With MORNSUN's Module) perf. Criteria A

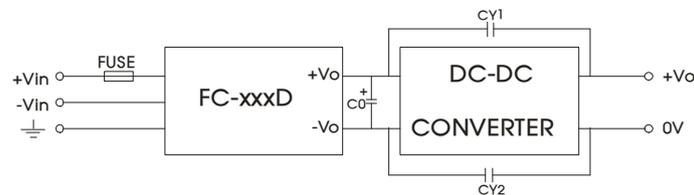
Note: All EMC specifications above are tested using the circuit shown in Typical Application.

Typical Characteristic Curves

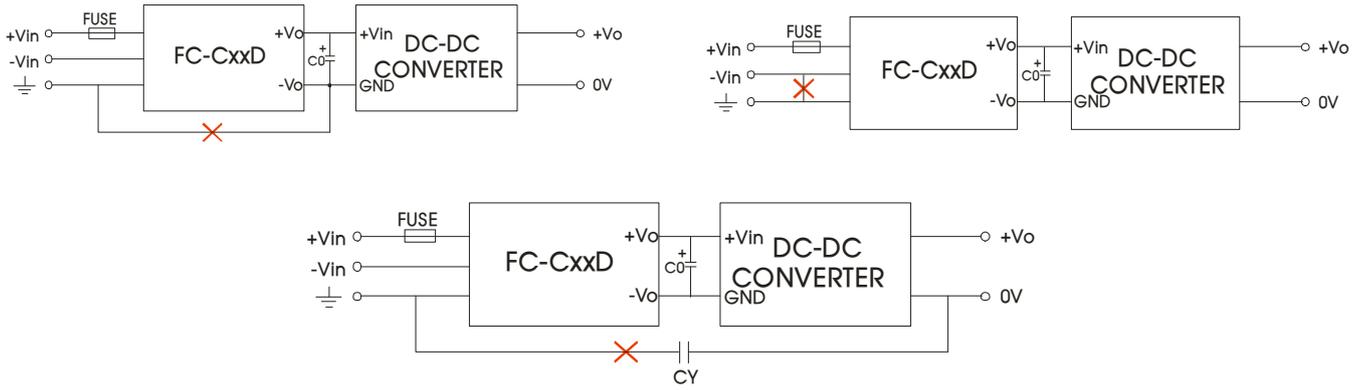


Design Reference

1. Typical application



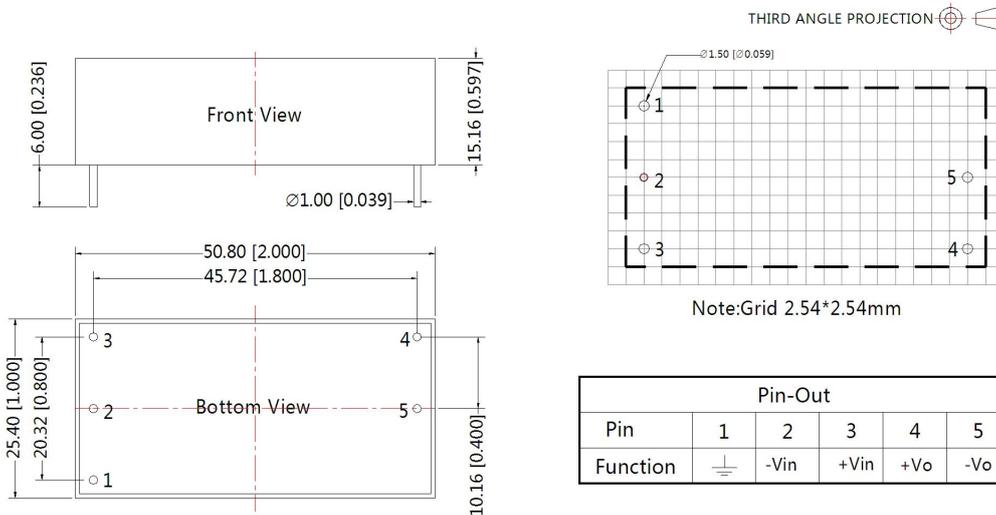
Model	Recommended external component values	
C0	FC-C01D&FC-CX1D	100uF/200V electrolytic capacitor
	FC-C03D	200uF/400V electrolytic capacitor
CY1, CY2	1nF/2000V	
FUSE	The fuse value varies with different power modules and must be selected in accordance with the specified input current of the corresponding power converter, but not exceeding the filter specifications.	



Note: Connections marked with X interfere with this filter modules performance and should therefore not be used

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

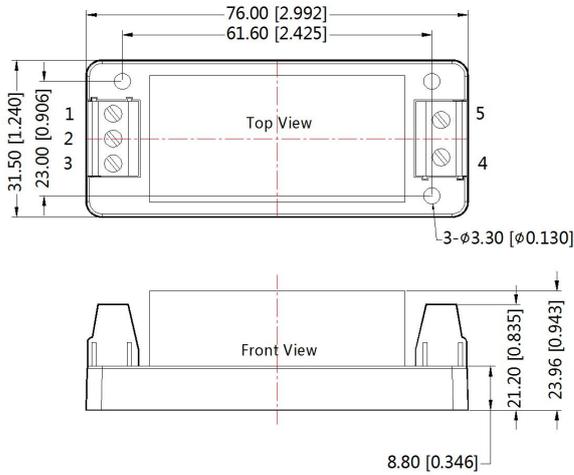
FC-C01D Dimensions



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

FC-C01DA2S Dimensions

THIRD ANGLE PROJECTION 

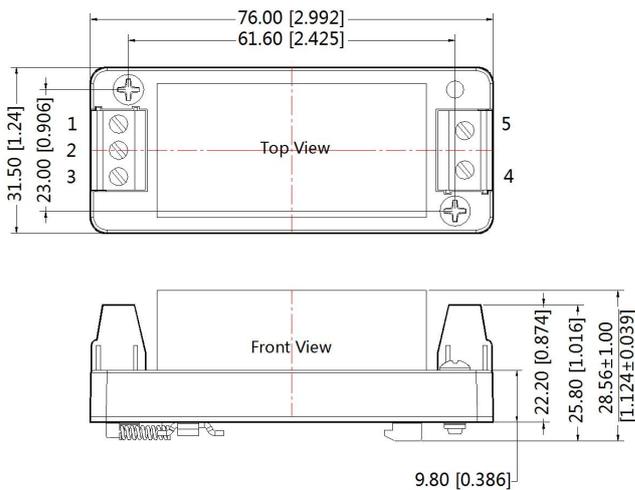


Pin-Out					
Pin	1	2	3	4	5
Function		-Vin	+Vin	+Vo	-Vo

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: $\pm 0.50[\pm 0.020]$

FC-C01DA4S Dimensions

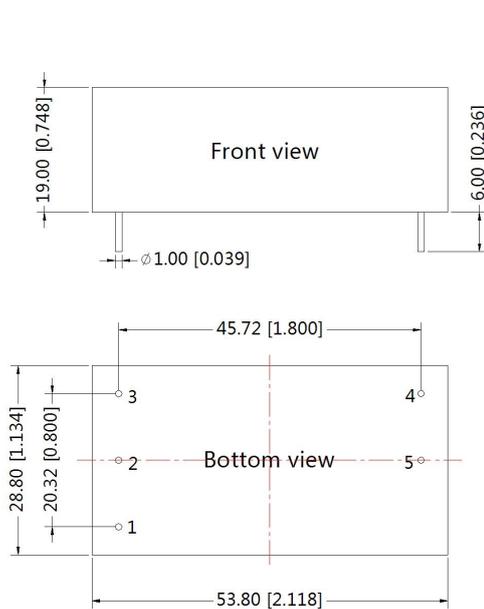
THIRD ANGLE PROJECTION 



Pin-Out					
Pin	1	2	3	4	5
Function		-Vin	+Vin	+Vo	-Vo

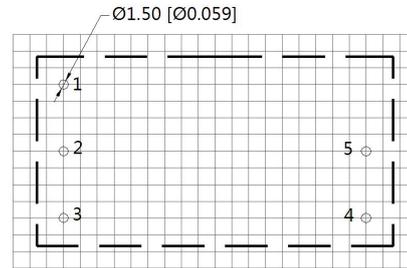
Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
Installed on DIN RAIL TS35
General tolerances: $\pm 0.50[\pm 0.020]$

FC-CX1D&FC-C03D Dimensions



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

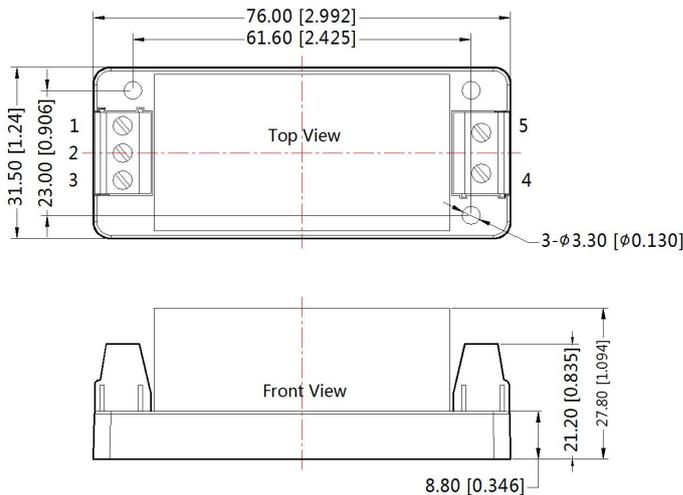
THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	
2	-Vin
3	+Vin
4	+Vo
5	-Vo

FC-CX1DA2S & FC-C03DA2S Dimensions



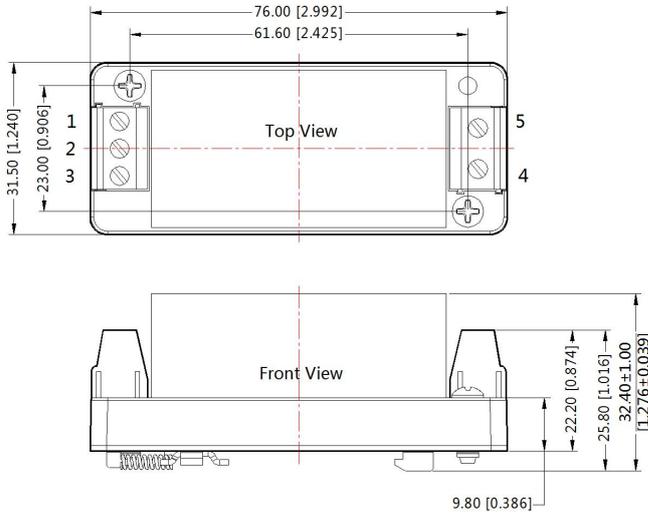
THIRD ANGLE PROJECTION

Pin-Out					
Pin	1	2	3	4	5
Function		-Vin	+Vin	+Vo	-Vo

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±0.50[±0.020]

FC-CX1DA4S&FC-C03DA4S Dimensions

THIRD ANGLE PROJECTION 



		Pin-Out				
Pin		1	2	3	4	5
Function			-Vin	+Vin	+Vo	-Vo

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
Installed on DIN RAIL TS35
General tolerances: ±0.50[±0.020]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220003 (FC-C01D), 58220005 (FC-CX1D&FC-C03D), the Packaging bag number of A2S/A4S package: 58220022;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. 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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