FC-FX3D

EMC Filter



FEATURES

- Meet IEC/EN61000-4 series standards and CISPR32/EN55032
- Meet railway industry EN50155 standards
- Efficiency up to 98%

The filter module are extremely useful in noise-sensitive analog circuit applications. FC-FX3D connected on the input side of DC/DC converters can ensure system compliance with EMC requirements according to EN50155 standards. MORNSUN' s DC/DC railway converter module can be used with the filters as long as the DC-DC converters input voltage does not exceed FC-FX3D maximum voltage rating.

Selection Guide				
Model	Input Voltage Range (VDC)	Rated Current (A)		
FC-FX3D	110 (14-160)	3.5		

Input Specifications					
Item	Test Conditions	Min.	Тур.	Max.	Unit
Input Voltage	Operating temperature range	14	110	160	VDC
No Load Input Current	25℃		2	4	mA

Output Specifications					
Item	Test Conditions	Min.	Тур.	Max.	Unit
Efficiency	25°C, 110VDC, 100%lo	96	98		%
Operating Current			3.5		А

General Specifications						
Item	Test Conditions	Min.	Тур.	Max.	Unit	
Operating Temperature		-40		105		
Storage Temperature		-55		125	°C	
Welding Temperature	Wave soldering welding, 10 seconds MAX	+ 255	+ 260	+ 265		
Storage Humidity		5		95	%RH	
Case Temperature Rise	25°C, 110VDC @100W		25		°C	
Withstand voltage	+Vin~ $\stackrel{\perp}{=}$, -Vin~ $\stackrel{\perp}{=}$, electric strength test for 1 minute with a leakage current of 5mA max	1500			VAC	
MTBF	MIL-HDBK-217F@25℃ 1000			K hours		

MORNSUN®

MORNSUN Guangzhou Science & Technology Co., Ltd.

FC-FX3D

MORNSUN®

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	53.80 x 28.80 x 19.00 mm
Weight	40g(Typ.)

Electror	nagneti	c Compati	bility (EMC) (EN50155: EN50121-3-2)	
	CF	FN50121-3-2	150kHz-500kHz 99dBuV (see Fig. 1 for recommended circuit)	
			500kHz-30MHz 93dBuV (see Fig. 1 for recommended circuit)	
Emissions			30MHz-230MHz 40dBuV/m at 10m (see Fig. 1 for recommended circuit)	
	RE	EN55011	230MHz-1GHz 47dBuV/m at 10m (see Fig. 1 for recommended circuit)	
			1GMHz-6GHz 47dBuV/m at 10m (see Fig. 1 for recommended circuit)	
	ESD	EN61000-4-2	Contact ±6KV, Air ±8KV	perf. Criteria A
			80 – 800MHz 20V/m	
			800 – 1000MHz 20V/m	
	RS	S EN61000-4-3	1400 – 2000MHz 10V/m	perf. Criteria A
			2000 – 2700MHz 5V/m	
			5100 – 6000MHz 3V/m	
Immunity	EFT	EN61000-4-4	±2kV 5/50ns 5kHz (see Fig. 1 for recommended circuit)	perf. Criteria A
minumity			line to line ± 1 KV (42 Ω , 0.5 μ F) line to ground ± 2 kV (42 Ω , 0.5 μ F)	
			(see Fig. 1 for recommended circuit)	
Sur	Surgo	ENG1000 4 E	line to line ± 1 KV (2 Ω , 18 μ F) line to ground ± 2 kV (12 Ω , 9 μ F)	porf Critoria A
	Surge	EIN61000-4-5	(see Fig. 1 for recommended circuit)	peri. Criteria A
			line to line $\pm 2KV (2\Omega, 18 \muF)$ line to ground $\pm 2kV (12\Omega, 9 \muF)$	
			(see Fig. 1 for recommended circuit)	
	CS	EN61000-4-6	0.15MHz-80MHz 10V r.m.s	perf. Criteria A

Electromagnetic Compatibility (EMC) (AREMA)						
		CISPR16-2-1	150kHz-500kHz	79dBuV	CLASS A (see Fig. 1 for recomr	nended circuit)
	CE				CLASS B (see Fig. 2 for recommer	nded circuit)
		CISPR16-1-2	500kHz-30MHz	73dBuV	CLASS A (see Fig. 1 for recom	mended circuit)
Emissions					CLASS B (see Fig. 2 for recommer	nded circuit)
LIIIISSIOIIS		CISPR16-2-3	30MHz-230MHz	40dBuV/m a	t 10m CLASS A (see Fig. 1 for recom	mended circuit)
	RF				CLASS B (see Fig. 2 for recommer	nded circuit)
			230MHz-1GHz	47dBuV/m at	10m CLASS A (see Fig. 1 for recomm	ended circuit)
					CLASS B (see Fig. 2 for recommer	nded circuit)
	ESD	IEC61000-4-2	Contact ±6KV, Ai	r ±8KV		perf. Criteria A
			80 – 1000MHz	10V/m		
			160 – 165MHz	20V/m		
	RS	RS IEC61000-4-3	450 – 470MHz	20V/m		nerf Criteria A
	113		800 – 960MHz	20V/m		pen. entena X
			1400 – 2000MHz	20V/m		
Immunity			2100 – 2500MHz	5V/m		
	EFT	IEC61000-4-4	±2kV 5/50ns	5kHz (see Fig. ²	l for recommended circuit)	perf. Criteria A
			line to line ±1KV (4	42Ω, 0.5μF) lin	e to ground ±2kV (42Ω, 0.5 μ F)	
			(se	e Fig. 1 for recor	nmended circuit)	
	Surge	IEC61000-4-5	line to line ±1KV (2	2Ω, 18μF) line	to ground ±2kV (12Ω, 9μF)	perf. Criteria A
			(se	e Fig. 1 for recor	nmended circuit)	
			line to line ±2KV (2	2Ω, 18μF) line	to ground ±2kV (12Ω, 9 μ F)	
MORNSUN® MORNSUN Guangzhou Science & Technology Co., Ltd.						

2025.1.24-A/1 Page 2 of 5

MORNSUN Guangzhou Science & Technology Co., Ltd. reserves the copyright and right of final

MORNSUN®

FC-FX3D

		(see Fig. 1 for recommended circuit)	
	CS	IEC61000-4-6 0.15MHz-80MHz 10V r.m.s	perf. Criteria A
	MC	IEC61000-4- 60Hz 100A/m (see Fig. 1 for recommended circuit)	port Critoria A
IVIS	8 60Hz 300A/m (see Fig. 1 for recommended circuit)	pen. Chtena A	

Product Typical Curve





Design Reference

1. Typical application



Fig.1

CLASS A	Model	Parameters
	C01, C02	100uF/250V electrolytic capacitor
	D1	20A/250V schottky Diode
	CY1, CY2	1000pF/400VAC safety capacitor
		The Breaker value varies with different power modules and must be selected
	Breaker	in accordance with the specified input current of the corresponding power
		converter, but not exceeding the filter specifications.

MORNSUN[®]

MORNSUN Guangzhou Science & Technology Co., Ltd.

2025.1.24-A/1 Page 3 of 5

MORNSUN Guangzhou Science & Technology Co., Ltd. reserves the copyright and right of final

MORNSUN®



	Model	Parameters
	C1	102K/3000V ceramic capacitor
	C03, C04	100uF/250V electrolytic capacitor
	C05	27uF/250V electrolytic capacitor
CLASS B	D1	20A/250V schottky Diode
	CY3, CY4, CY5, CY6	1000pF/400VAC safety capacitor
	LCM1	1.45mH, recommend to use MORNSUN' s FL2D-30-222-DT common mode
		inductance
		The Breaker value varies with different power modules and must be selected
	Breaker	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 application notes on www.mornsun-power.com

MORNSUN®

MORNSUN Guangzhou Science & Technology Co., Ltd.

2025.1.24-A/1 Page 4 of 5

MORNSUN Guangzhou Science & Technology Co., Ltd. reserves the copyright and right of final

FC-FX3D

Dimensions and Recommended Layout



-Ø1.50 [Ø0.059]

Note: Grid 2.54*2.54mm

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

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

Note:

- 1. For additional information on Product Packaging please refer to <u>www.mornsun-power.com</u>. Packaging bag number: 58220005;
- 2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated load;
- 3. All index testing methods in this datasheet are based on our 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.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 8 Nanyun 4th Road, Huangpu District, Guangzhou, China

Tel: 86-20-38601850 Fax:

Fax: 86-20-38601272 E-mail: info@mornsun.cn

www.mornsun-power.com

MORNSUN®

MORNSUN Guangzhou Science & Technology Co., Ltd.

2025.1.24-A/1 Page 5 of 5

MORNSUN Guangzhou Science & Technology Co., Ltd. reserves the copyright and right of final

MORNSUN[®]

THIRD ANGLE PROJECTION