## **EMC** Filter

FC-F18D

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The filter module are extremely useful in noise-sensitive analog circuit applications. FC-F18D 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-F18D maximum voltage rating.

**FEATURES** 

Selection Guide								
Model	Input Voltage Range (VDC)	Rated Current (A)						
	110	83						
FC-FIOD	(14-160)	8.3						

Input Specifications								
Item	Test Conditions	Min.	Тур.	Max.	Unit			
Input Voltage	Operating temperature range	14	110	160	VDC			
No Load Input Current	25°C, 110VDC		0		mA			

Output Specifications									
Item	Test Conditions	Min.	Тур.	Max.	Unit				
Efficiency	25°C, 24VDC@200W	96	98		%				
Operating Current <sup>1</sup>			8.3	12	А				
Transient Maximum Current <sup>®</sup>				18	А				
Note:									

①Operating current please refer to temperature derating curves;

②Meet the instantaneous load of 10s, the maximum output current is 18A.

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 @200W		7		°C				
Withstand voltage	+Vin~ $\stackrel{-}{=}$ , -Vin~ $\stackrel{-}{=}$ , electric strength test for 1	2100			VAC				

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	minute with a leakage current of 5mA max			
MTBF	MIL-HDBK-217F@25°C	1000	 	K hours

Mechanical Specifications					
Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)				
Dimensions	57.90 x 29.20 x 23.50 mm				
Weight	74.0g(Typ.)				

Electromagnetic Compatibility (EMC) (EN50121-3-2)								
		EN50121-3-2	EN55016-2-1 150kHz-500kHz 99dBuV (see Fig.1 for recommend	led circuit)				
	CE		500kHz-30MHz 93dBuV (see Fig.1 for recommende	ed circuit)				
		ENI55032	EN55032-11 150kHz-500kHz 79dBuV (see Fig.1 for recommended)	ed circuit)				
Emissions		ENSSUSE	500kHz-30MHz 73dBuV (see Fig.1 for recommended)	ed circuit)				
		CISPR16-2-3	30MHz-230MHz 40dBuV/m at 10m (see Fig.1 for recommended ci	rcuit)				
	RE		230MHz-1GHz 47dBuV/m at 10m (see Fig.1 for recommended circ	uit)				
			1GHz-6GHz 47dBuV/m at 10m (see Fig.1 for recommended circu	iit)				
	ESD	EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A				
	RS	EN61000-4-3	80 – 800MHz 20V/m					
			800 – 1000MHz 20V/m					
			1400 – 2000MHz 10V/m	perf. Criteria A				
			2000 – 2700MHz 5V/m					
1			5100 – 6000MHz 3V/m					
Immunity	EFT	EN61000-4-4	±2kV 5/50ns 5kHz (see Fig.1 for recommended circuit)	perf. Criteria A				
		EN61000-4-5	line to line ±1KV (42 $\Omega$ , 0.5 $\mu$ F) line to ground ±2kV (42 $\Omega$ , 0.5 $\mu$ F)					
	6		(see Fig.1 for recommended circuit)					
	Surge		line to line $\pm 1$ KV (2 $\Omega$ , 0.5 $\mu$ F) line to ground $\pm 2$ kV (12 $\Omega$ , 0.5 $\mu$ F)	perf. Criteria A				
			(see Fig.1 for recommended circuit)					
	CS	EN61000-4-6	0.15MHz-80MHz 10V r.m.s	perf. Criteria A				

Electromag	gnetic Co	mpatibility	(EMC) (AREMA )	
	CE	CISPR16-2-1 CISPR16-1-2	150kHz-500kHz 79dBuV (see Fig.1 for recommended circuit)	
Emissions	RE	CISPR16-2-3	30MHz-230MHz40dBuV/m at 10m(see Fig.1 for recommended circult)230MHz-1GHz47dBuV/m at 10m(see Fig.1 for recommended circult)	ircuit) uit)
	ESD	IEC61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A
RS	RS	IEC61000-4-3	80 - 1000MHz10V/m160 - 165MHz20V/m450 - 470MHz20V/m800 - 960MHz20V/m1400 - 2000MHz20V/m2100 - 2500MHz5V/m	perf. Criteria A
	EFT	IEC61000-4-4	±2kV 5/50ns 5kHz (see Fig.1 for recommended circuit)	perf. Criteria A
	Surge	IEC61000-4-5	line to line $\pm 2$ KV (2 $\Omega$ , 0.5 $\mu$ F) line to ground $\pm 2$ kV (see Fig.1 for recommended circuit)	perf. Criteria A
	CS	IEC61000-4-6	0.15MHz-80MHz 10V r.m.s	perf. Criteria A
	MS	IEC61000-4-8 IEC61000-4-8	60Hz100A/m (see Fig.1 for recommended circuit)60Hz300A/m (see Fig.1 for recommended circuit)	perf. Criteria A

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## **EMC** Filter

### FC-F18D

#### **Product Typical Curve**



#### Notes:

- 1. Test conditions of Efficiency VS Input Voltage curve: output power 200W, input voltage range 14 -160VDC;
- 2. Test conditions of Efficiency VS Output load curve: input voltage110VDC, output power 20-200W.

### Design Reference

1. Typical application

Notes: Matching UWTH1D\_HB-100WR3, UWTH1D\_HB-200WR3 series.



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Fig.1

	=	
Components	Value	Recommended Component
С0	22µF	Voltage≥450V
C4, C5	1nF	Voltage≥50V
C6	220µF	Voltage≥250V
С7	47µF	Voltage≥1.2*Vo
C8, C9	10μF	Voltage≥1.2*Vo
LCM1	4uH.min	FL2D-D0-040
CY1, CY2, CY3, CY4, CY5, CY6	1000 pF/400VAC	Y1 safety capacitor
D1	20A	Voltage≥250V
Breaker	18A	

Surge Standards	Components	Value	Recommended Component		
line to line $\pm 1 \text{KV}$ (42 $\Omega$ , 0.5 $\mu$ F)	C1	68µF	Voltage≥250V		
line to ground $\pm 2kV$ (42 $\Omega$ , 0.5 $\mu$ F)	C2, C3	No need	No need		
line to line $\pm 1$ KV (2 $\Omega$ , 0.5 $\mu$ F)	C1, C2	100µF	Voltage≥250V		
line to ground $\pm 2kV$ (12 $\Omega$ , 0.5 $\mu$ F)	C3	No need	No need		
line to line $\pm 2$ KV (2 $\Omega$ , 0.5 $\mu$ F)	C1 C2 C2	100			
line to ground $\pm 2kV$ (2 $\Omega$ , 0.5 $\mu$ F)	C1, C2, C3	ισομε	voitage≥250v		

+Vino ×	-	+Vo		+Vin	+Vo •-	+Vo	+Vino × Breaker	-	+Vo	• +Vir	ר +Vo •	) +Vo
-Vin o	FC-F18D			• Ctrl	DC-DC CONVERTER Trim•		-Vin o	- FC-F18D		• Ctrl	sense+ • DC-DC CONVERTER Trim•	, ,
PE •	_	-V0	 	• -Vin	sense- ⊷ 0V ⊷	ov	PE ⊶	-	-V0	• -Vin	sense-	) ov
	$\checkmark$									-		

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



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#### FC-F18D

#### **Dimensions and Recommended Layout**



#### Note:

- 1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220052;
- 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.

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