MORNSUN®

EMC Filter

3 years Warranty RoHS

FEATURES

- Ultra wide input voltage range：36-72VDC
- Input current range: Steady state：20A MAX
- Compact size：61.80mm x 40.20mm x 12.80mm
- Operating ambient temperature range：-40℃ to +85℃
- EMC standards compliance：IEC/EN61000-4、CISPR32/EN55032
- Meet with safety standards：IEC62368

This product is suitable for analog circuits and other noisy sensitive occasions, EMC auxiliary module installed in the input end of the DC/DC power module can improve the EMC performance of power supply products in the CISPR32/EN55032 standard.The maximum input voltage of the mornsun power supply should not be greater than the maximum operating voltage of the filter, and the maximum input current should be less than the maximum operating current of the filter.

Selection Guide

Model	Operating Voltage(VDC)		Operating Current(A)		Surge Performance
	Typ.(Range)	Max*	Typ.(Range)	Max*	
FC-D20QB-R2	48 (36-72)	72	--	20	Line - Line ±2kV Line - PE ±2kV

Note: * The input voltage must not exceed this value, otherwise permanent and unrecoverable damage may be caused.
* The filter cannot be powered by an air switch and does not support hot swapping.

General Specifications

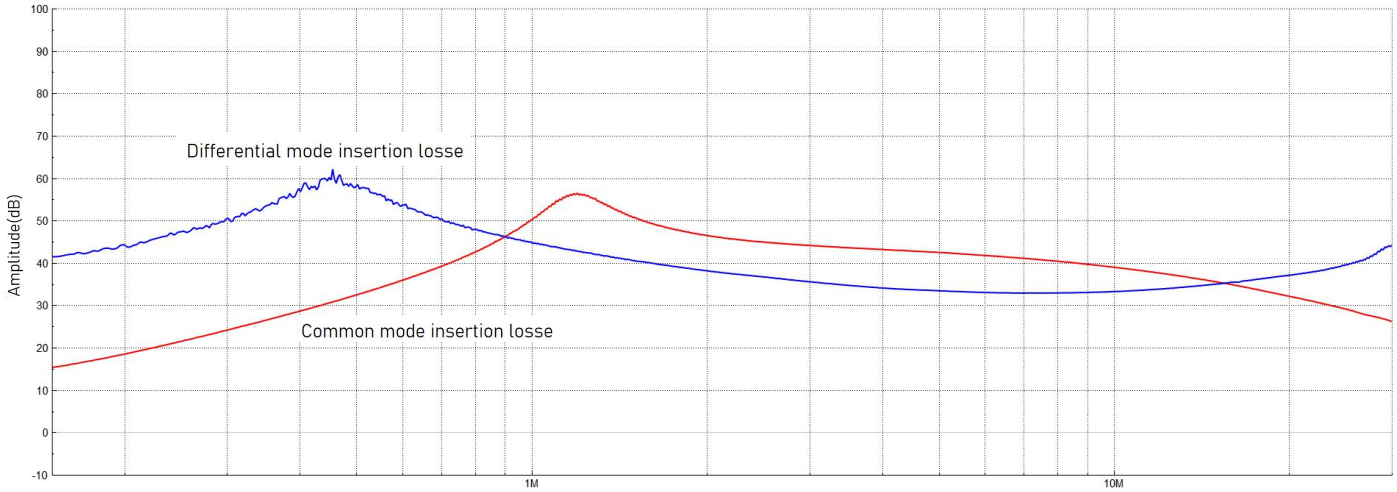
Item		Test Conditions	Min.	Typ.	Max.	单位
Operating Temperature			-40	--	+85	℃
Storage Temperature			-55	--	+125	
Pin soldering resistance temperature*		Manual welding. The soldering points are 1.5mm away from the casing. Duration: 10 seconds	--	--	+300	
		Wave soldering process, maximum 10 seconds	+255	+260	+265	
Storage Humidity		Non-condensing	5	--	95	%RH
Isolation Voltage	+Vin～PE	Electric strength test for 1min, leakage current <1mA	--	--	1500	VDC
	-Vin～PE					
surge voltage(1sec.max)		100VDC (1s) /0VDC (3s), impulse three times	--	--	100	
MTBF		MIL-HDBK-217F@25℃	1000	--	--	K hours
Shock and Vibration Test			10-500Hz,0.07g²/Hz, 10min. along X, Y and Z			
Altitude*		86-106KPa	≤5000m			
Insertion loss（CM/DM）		150KHz~1MHz	15	20	--	dB
		1MHz~10MHz	30	35	--	dB
		10MHz~30MHz	20	25	--	dB

Note: *The pin's soldering temperature tolerance is not the actual temperature set by the soldering iron, but the temperature required for a good solder joint. The actual temperature set by the customer should be determined comprehensively based on the differences in PCB thickness, copper coating size, soldering iron power, and soldering iron tip selection.
*When the product is used at an altitude of 2000m or above, it is necessary to ensure that the surface temperature of the product is below 92℃.

Physical Characteristics

Case Material*	Aluminum alloy shell, black flame-retardant and heat-resistant material bottom cover (UL94 V-0)
Dimension	61.80mm x 40.20mm x 12.80mm
Weight	64.0g(Typ.)
Cooling Method	Free air convection

Insertion Loss Specifications

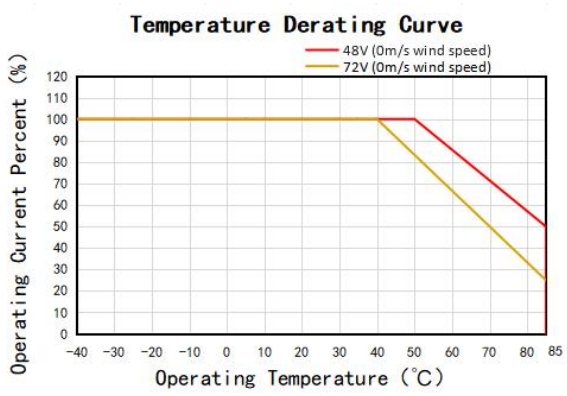


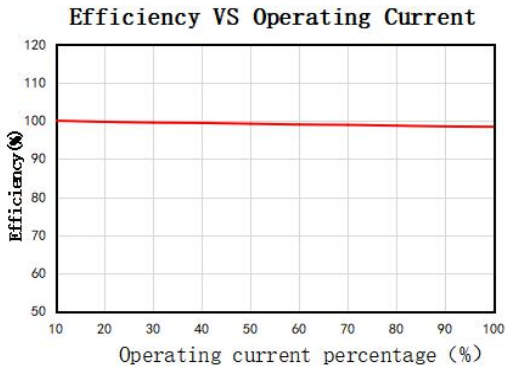
EMC Characteristics

EMI	CE	CISPR32/EN55032	Class B	Matching VCB48_QBO-800WR3A(D)-N （See figure1-②/1-③）
	RE	CISPR32/EN55032	Class B	Matching VCB48_QBO-800WR3A(D)-N （See figure1-③）
EMS	ESD	IEC/EN61000-4-2	Contact ±6kV AIR ±8KV	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV 100KHz	perf. Criteria B （See figure 1-①）
	Surge	IEC/EN61000-4-5	Line - Line ±2kV Line - PE ±2kV	perf. Criteria A （See figure 1-①）
	CS	IEC/EN61000-4-6	0.15MHz-80MHz 10V r.m.s	perf. Criteria A （See figure 1-①）
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A （See figure 1-①）

Note：The above performance indicators: CE and RE are the test results of our company's power supply VCB48_QBO-800WR3A(D)-N series.

Product Typical Curve





Note: This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

EMC Design Reference

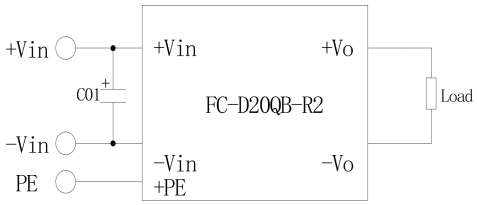


Figure 1-①

Components	Value
C01	150uF/100V
Note: If the filter is used for EMI testing, an electrolytic capacitor with a capacitance of at least 150uF should be added in front of the filter.	

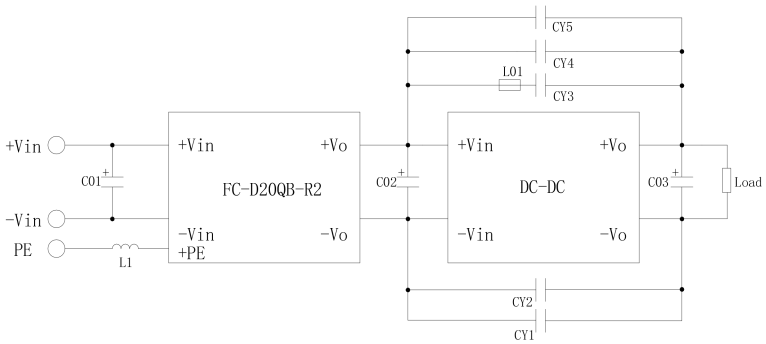


Figure 1-②

Components	Value
C01	150uF/100V
L1	1uH/8mΩMax Recommend HUASUN TECH HCMD0603-1R0M
C02	470uF/100V
CY1	Y1/102M/400VAC(Three Y capacitors in parallel)
CY2、CY3	Y1/222M/400VAC

CY4	Y1/102M/400VAC
CY5	Y1/681M/400VAC(TWO Y capacitors in parallel)
L01	Magnetic Beads ZF-2C/T3.50*1.78*1.50/G610±25%
C03	470uF/35V
Note: The above peripheral circuit is used for CE testing supporting our DC/DC power supply model VCB48_QBO-800WR3A(D)-N.	

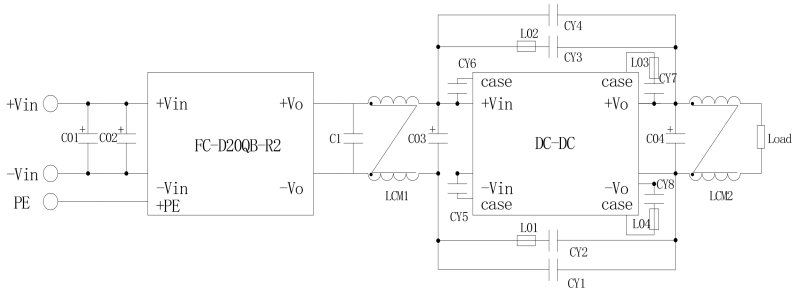
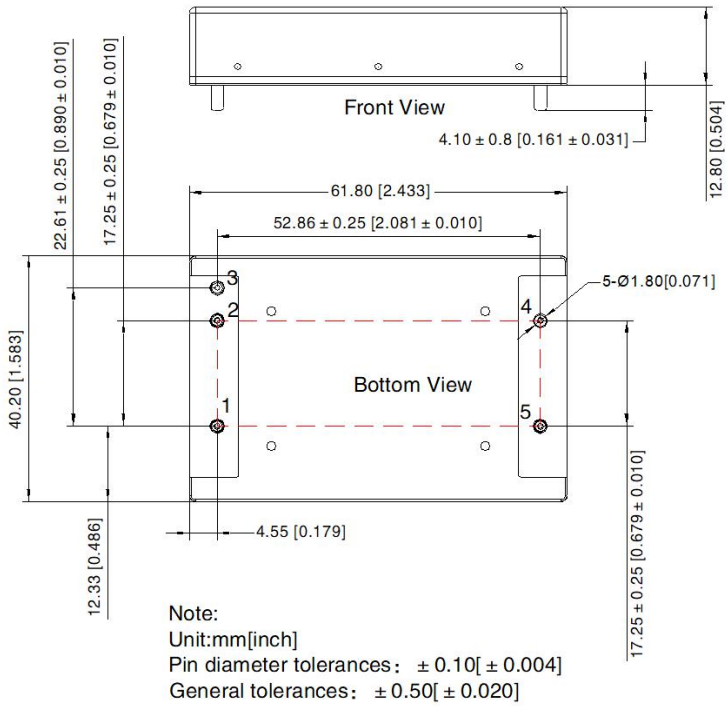
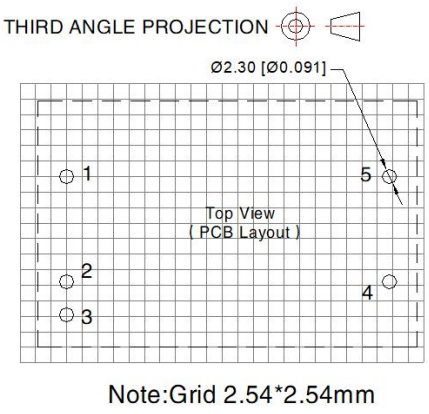


Figure 1-③

Components	Value
C01	150uF/100V
C02、C03	470uF/100V
C1	4.7uF/100V(Two cap acitors in parallel)
CY1、CY4	Y1/471M/400VAC(Three Y capacitors in parallel)
CY2、CY5、CY6	Y1/102M/400VAC
CY3	Y1/222M/400VAC
CY7、CY8	Y1/102M/400VAC(Two Y capacitors in parallel)
C04	470uF/35V
LCM1	22uH，Recommend our series inductors FL2D-B0-220
LCM2	4uH，Recommend our series inductors FL2D-F5-040
L01、L02、L03、L04	Magnetic Beads ZF-2C/T3.50*1.78*1.50/G610±25%
Note: The above peripheral circuit is used for CE、RE testing supporting our DC/DC power supply model VCB48_QBO-800WR3A(D)-N.	

Dimensions and Recommended Layout





Pin	Mark
1	+Vin
2	–Vin
3	PE
4	–Vo
5	+Vo

Note: The distance between the edge of the pads of pins 2 and 3 should be greater than the safety distance of 1.25mm.

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58010113;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, 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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