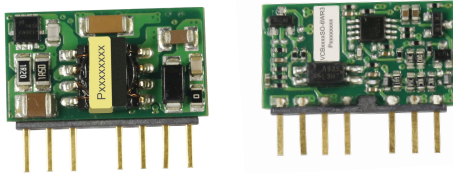


6W isolated DC-DC converter in SIP package
Wide input and regulated single output



FEATURES

- Wide 2:1 input voltage range
- High efficiency up to 85%
- No-load power consumption as low as 0.14W
- I/O isolation test voltage: 1.5k VDC
- Input under-voltage protection, output short-circuit, over-current protection
- Operating ambient temperature range: -40°C to +85°C
- Industry standard pin-out

VCB48_SO-6WR3 series are isolated 6W DC-DC converter products with a wide 2:1 input voltage range. They feature efficiencies of up to 85%, 1500VDC input to output isolation voltage, operating ambient temperature of -40°C to +85°C, input under-voltage, output short-circuit, over-current protection. They are widely used in applications such as communications, medical, industrial controls, electric power, instrumentation and so on.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency ^② (%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max. ^①	Voltage(VDC)	Current (mA) Max./Min.		
EN/BS EN	VCB4805SO-6WR3	48 (36-75)	80	5	1200/0	79/81	1000
	VCB4812SO-6WR3			12	500/0	81/83	470
	VCB4815SO-6WR3			15	400/0	82/84	330
	VCB4824SO-6WR3			24	250/0	83/85	100

Note:
① Exceeding the maximum input voltage may cause permanent damage;
② Efficiency is measured at nominal input voltage and rated output load.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	Nominal input voltage	--	155/3	159/12	mA
Reflected Ripple Current		--	50	--	
Surge Voltage (1sec. max.)		-0.7	--	80	VDC
Start-up Voltage		--	--	36	
Under-voltage Protection		25	28	--	
Input Filter		Capacitance filter			
Hot Plug		Unavailable			
Ctrl *	Module on	Ctrl pin open or pulled high(3.5-12VDC)			
	Module off	Ctrl pin pulled low to GND(0-1.2VDC)			
	Input current when off	--	3	10	mA

Note: *The voltage of Ctrl pin is relative to input pin GND.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Voltage Accuracy ^①	5% -100% load	--	±1	±3	%	
Linear Regulation	Full load, the input voltage is from low to high	--	±0.5	±1		
Load Regulation	0% -100% load	--	±0.5	±1.5		
Transient Recovery Time		--	300	500	μs	
Transient Response Deviation	25% load step change, nominal input voltage	5V output	--	±5	±8	%
		Others	--	±2.5	±5	

Temperature Coefficient	Full load	--	--	±0.03	%/°C
Ripple & Noise ^②	20MHz bandwidth, 5% -100% load	--	100	200	mVp-p
Over-current Protection	Input voltage range	110	160	250	%Io
Short-circuit Protection	Input voltage range	Continuous, self-recovery			
Notes : ①Output voltage accuracy at <5% load is ±4% max; ②Ripple & Noise at <5% load is 350mV max. The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.					

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output electric strength test for 1 minute with a leakage current of 1mA max.	1500	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	1000	--	pF
Operating Temperature	Derating when operating temperature ≥50°C	-40	--	+85	°C
Storage Humidity	Non-condensing	5	--	95	%RH
Storage Temperature		-55	--	+125	°C
Pin Soldering Resistance Temperature*	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
	Wave soldering, 10 seconds	255	260	265	
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency ^①	PWM mode	--	460	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	k hours

Note: *The pin resistance temperature is not the actual set temperature of the soldering iron, but the temperature required for a good solder joint. The actual set temperature by the customer needs to be comprehensively set based on the thickness of the PCB, the size of the copper cladding, the power of the soldering iron, and the selection of the soldering iron tip.

①Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Mechanical Specifications

Dimensions	22.00 x 12.80 x 8.20 mm
Weight	2.2g (Typ.)
Cooling Method	Nature convection or forced convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 3-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B (see Fig. 3-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±4kV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV (see Fig. 3-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	±2kV (see Fig. 3-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Typical Characteristic Curves

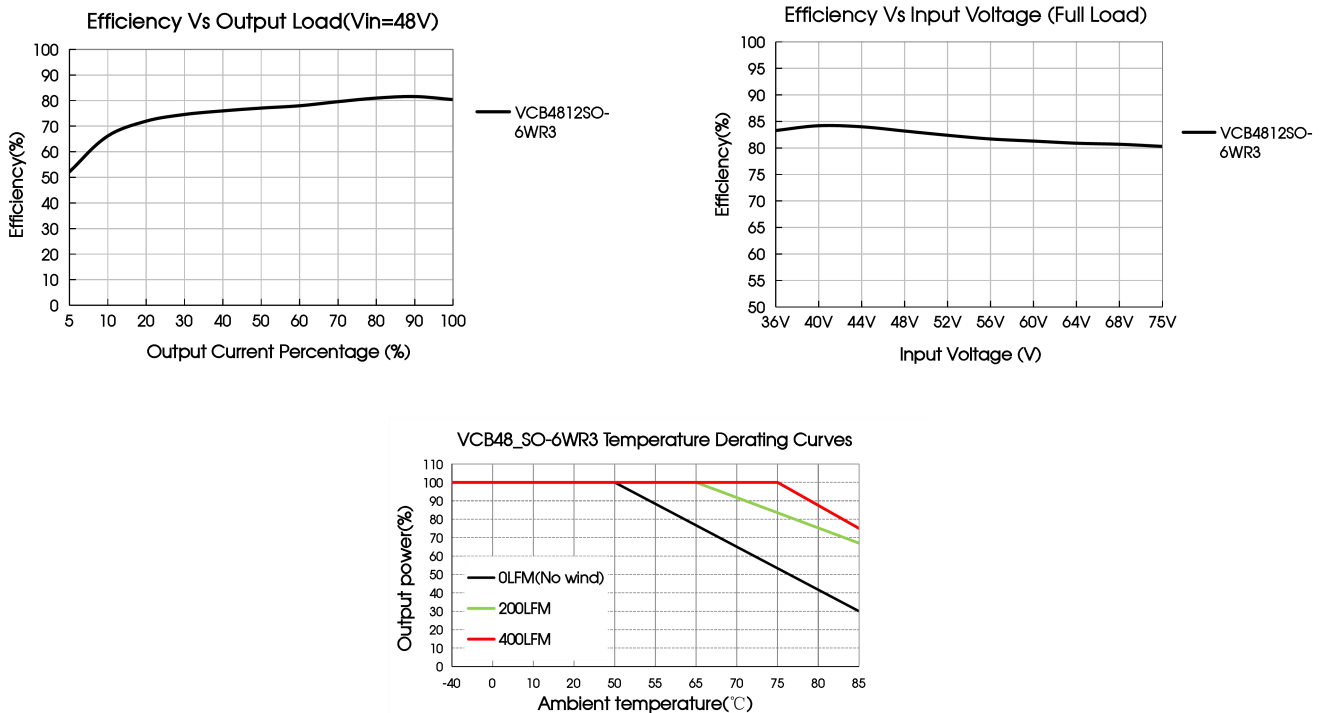


Fig. 1

Design Reference

1. Typical application

All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.



Fig. 2

Cin	Cout
10-47µF/100V	10µF/50V

2. EMC solution-recommended circuit

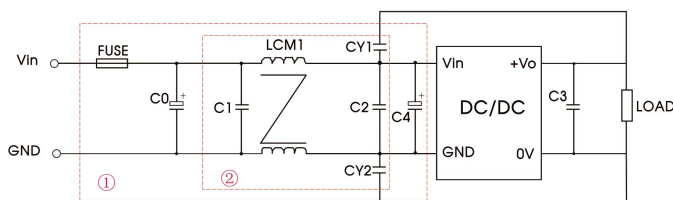


Fig. 3

Note: For EMC tests we use Part ① in Fig. 3 and part ② for emissions test. Selecting based on needs.

Parameter description:

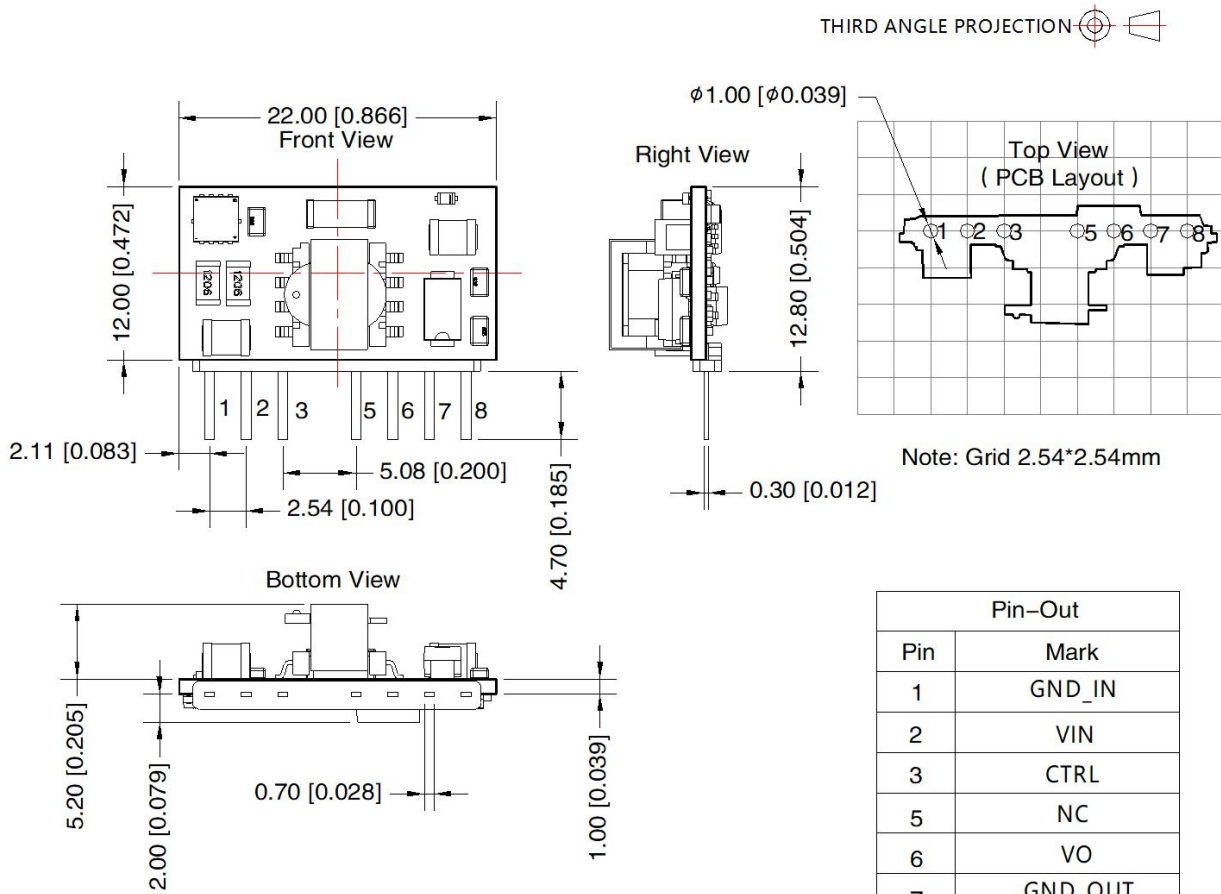
Model	VCB48_SO-6WR3
FUSE	Selected based on the actual input current in application
C0/C4	470µF/100V
C1/ C2	4.7µF/100V
C3	10µF/50V
LCM1	4.7mH (FL2D-10-472)
CY1/CY2	1nF/400VAC

3. The products do not support parallel connection of their output

4. For additional information please refer to DC-DC converter application notes on

www.mornsun-power.com

Dimensions and Recommended Layout



Pin-Out	
Pin	Mark
1	GND_IN
2	VIN
3	CTRL
5	NC
6	VO
7	GND_OUT
8	NC

Note:
Unit: mm[inch]
General tolerances: ± 0.50 [± 0.020]
The layout of the device is for reference only,
please refer to the actual product

- Note:
- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210103;
 - The maximum capacitive load offered were tested at input voltage range and full load;
 - 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;
 - All index testing methods in this datasheet are based on our company corporate standards;
 - We can provide product customization service, please contact our technicians directly for specific information;
 - Products are related to laws and regulations: see "Features" and "EMC";
 - 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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