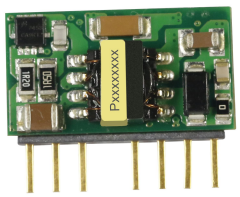
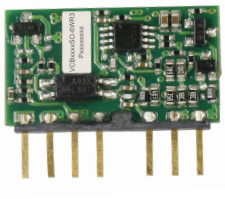
6W isolated DC-DC converter in SIP package
Wide input, regulated single output

CE Patent Protection RoHS

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℃ to +85℃
- Industry standard pin-out
- EN62368 approved

VCB48_SO-6WR3 series are isolated 6W DC-DC converter products with a wide 2:1 input voltage range, They feature efficiency up to 85%, input to output isolation voltage of 1500VDC, operating ambient temperature of -40℃ to +85℃, 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	Capacitive Load (μF)
		Nominal (Range)	Max.①	Voltage (VDC)	Current (mA) Max./Min.	Min./Typ.	Max.
CE	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

Notes: ①Exceeding the maximum input voltage may cause permanent damage;
②Efficiency 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 Accuracy①	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	25% load step change, nominal input voltage		--	300	500	μs
Transient Response Deviation		5V output	--	±5	±8	%
		Others	--	±2.5	±5	
Temperature Coefficient	Full load		--	--	±0.03	%/℃
Ripple & Noise②	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℃	-40	--	+85	℃
Storage Humidity	Non-condensing	5	--	95	%RH
Storage Temperature		-55	--	+125	℃
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from PCB for 10 seconds	--	--	+260	
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency①	PWM mode	--	460	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours

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

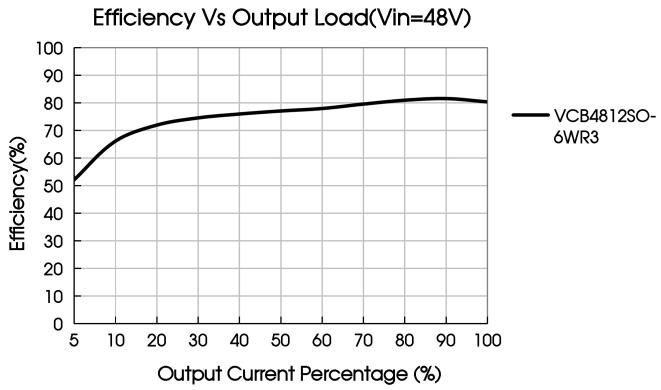
Mechanical Specifications

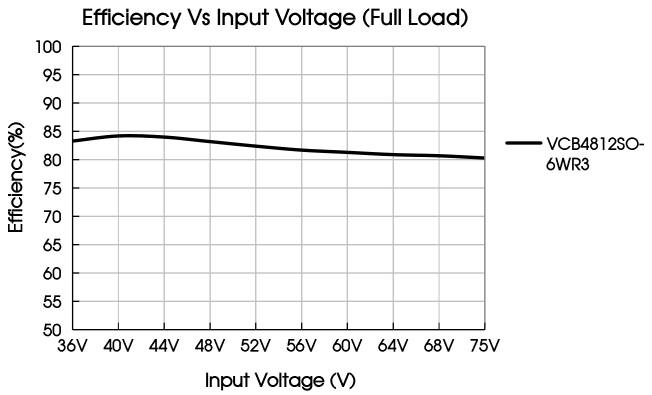
Dimensions	22.00 x 12.80 x 8.20 mm
Weight	2.2g (Typ.)
Cooling Method	Nature convection or forced convection

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





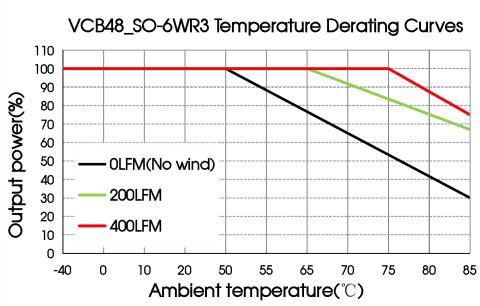


Fig. 1

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(μF)	Cout(μF)
10-47	10

2. EMC solution-recommended circuit

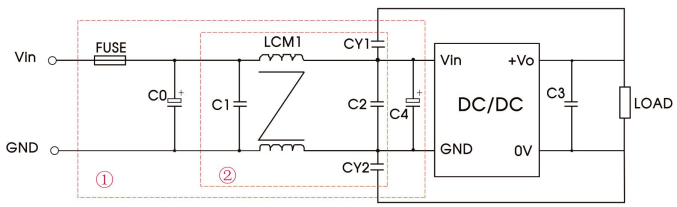


Fig. 3

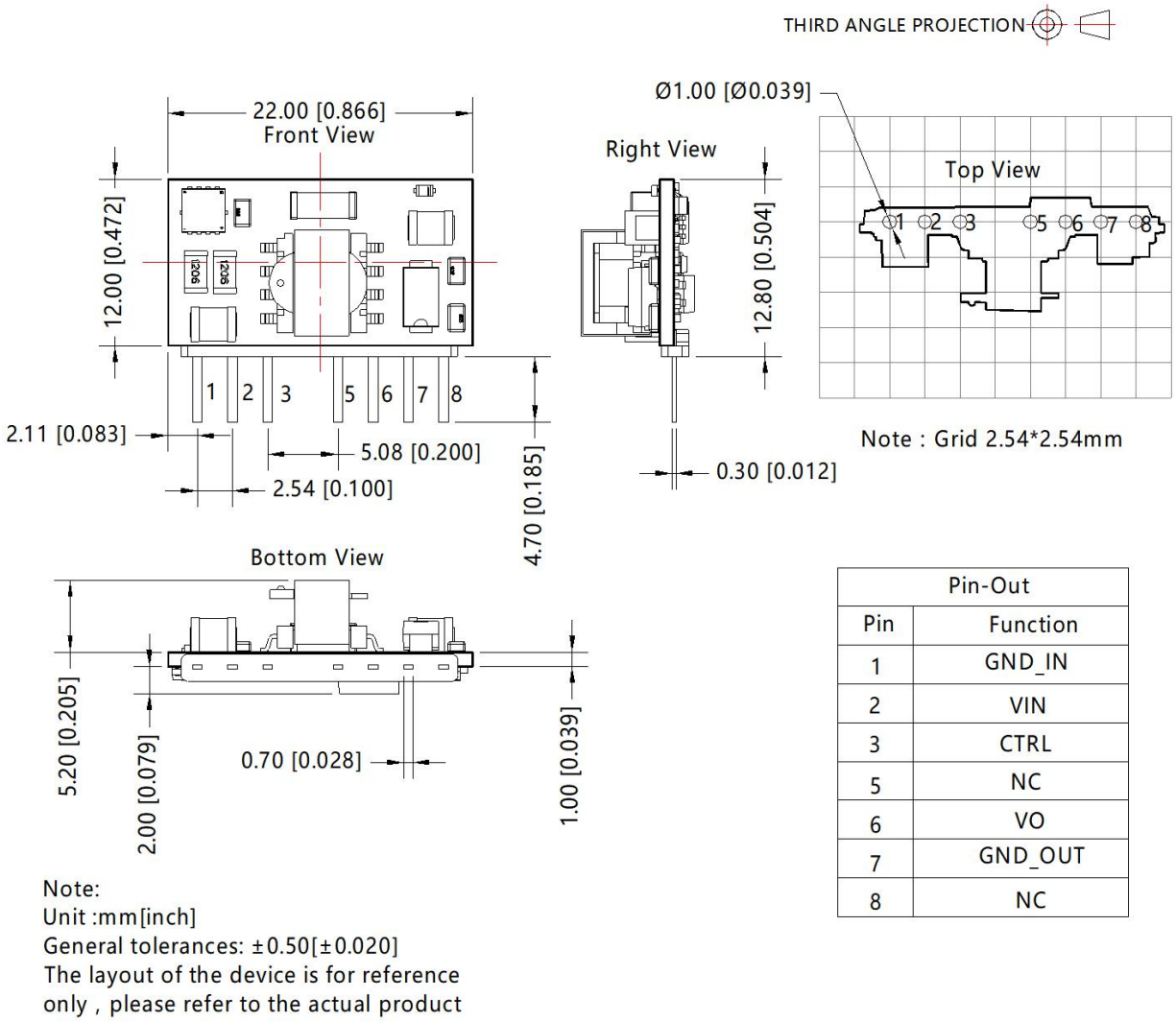
Note: For EMC tests we use Part ① in Fig. 3 and part ② for emissions test. Selecting based on needs.

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	Function
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

Notes:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210103;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. 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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