

10W isolated DC-DC converter
Wide input and regulated single output



CE Patent Protection RoHS



FEATURES

- Wide 2:1 input voltage range
- High efficiency up to 88%
- I/O isolation test voltage 1.5K VDC
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Operating ambient temperature range: -40°C to +85°C
- Industry standard 1/16 brick
- Meets UL62368 standard
- EN62368 approved

VCB48_SBO-10WR3-OEM series are isolated 10W DC-DC converter products with a 2:1 input voltage range. They feature efficiencies of up to 88%, 1500VDC input to output isolation, operating temperature of -40°C to +85°C, input under-voltage protection, output over-voltage, over-current and short circuit protection, which is widely used in communication field, such as switches, repeaters, intelligent communication gateways, GPS synchronous clock and 4G/5G base station etc.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency ^② (%) Min./Typ.	Max. Capacitive Load(μF)
		Nominal (Range)	Max. ^①	Voltage (VDC)	Current(mA) Max./Min.		
CE	VCB4805SBO-10WR3-OEM	48 (36-75)	80	5	2000/0	81/83	2200
	VCB4812SBO-10WR3-OEM			12	833/0	85/87	470
	VCB4815SBO-10WR3-OEM			15	667/0	86/88	330
	VCB4824SBO-10WR3-OEM			24	417/0	86/88	100

Notes:

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	--	252/4	258/8	mA
Reflected Ripple Current		--	50	--	
Surge Voltage (1sec. max.)		-0.7	--	100	VDC
Start-up Voltage		--	--	36	
Under-voltage Protection		26	29	--	
Start-up Time	Nominal input voltage & constant resistance load	--	--	100	ms
Input Filter		C filter			
Hot Plug		Unavailable			
Ctrl*	Module on	Ctrl pin open or pulled high (TTL 3.5-12VDC)			
	Module off	Ctrl pin pulled low to GND (0-1.2VDC)			
	Input current when off	--	6	10	mA

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

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy	5%-100% load	--	±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load	--	±0.2	±0.5	
Load Regulation ^①	5%-100% load	--	±0.5	±1	
Transient Recovery Time	25% load step change, nominal input voltage	--	300	500	μs
Transient Response Deviation	25% load step change, nominal input voltage	5V output	±5	±8	%
		Others	±3	±5	

Temperature Coefficient	Full load	--	--	±0.03	%/°C
Ripple & Noise ^②	20MHz bandwidth, 5%-100% load	--	100	120	mV p-p
Over-voltage Protection	Input voltage range	110	--	160	%Vo
Over-current Protection		110	140	190	%Io
Short-circuit Protection		Continuous, self-recovery			

Note:
^①Load regulation for 0%-100% load is ±3%;
^②Ripple & Noise at < 5% load is 5%Vo 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	See Fig. 1	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency*	PWM mode	--	300	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours

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

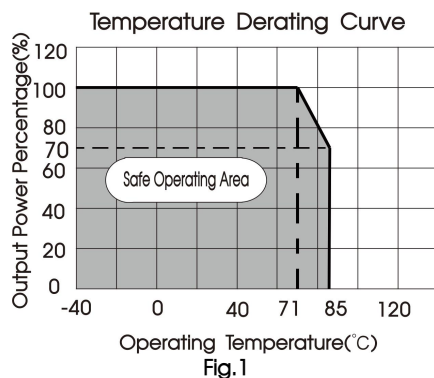
Mechanical Specifications

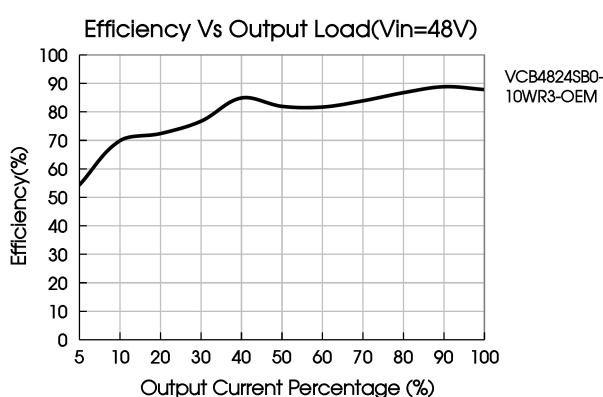
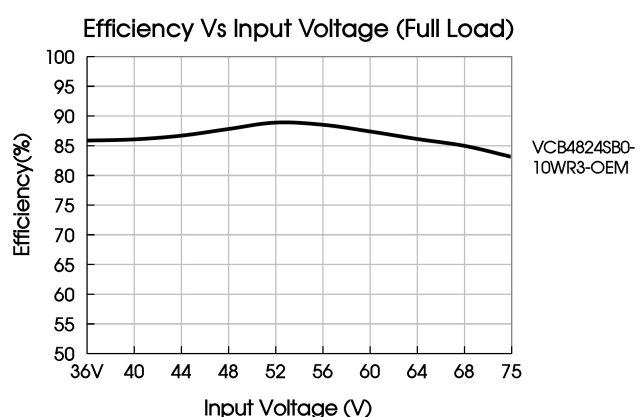
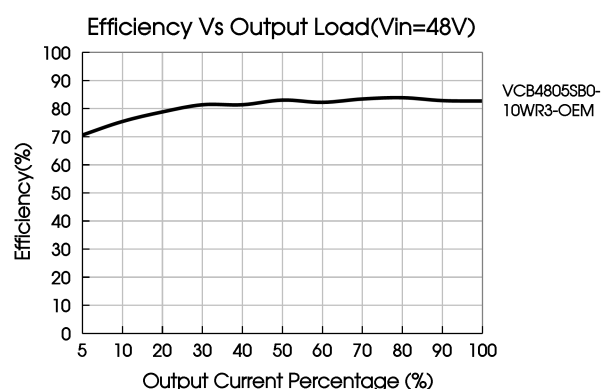
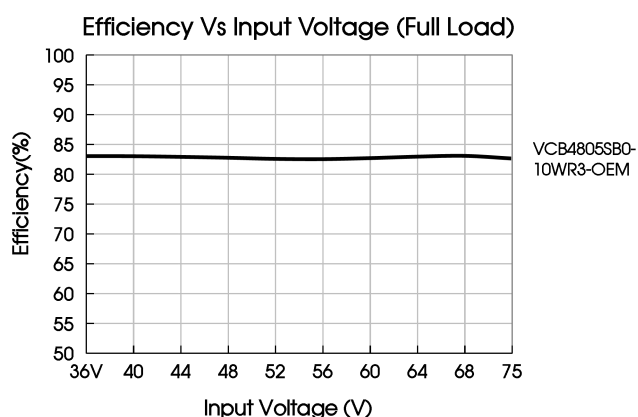
Dimensions	33.02 x 22.86 x 11.40mm
Weight	5.84g (Typ.)
Cooling Method	Free air convection

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	line to line ±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





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 C_{in} and C_{out} 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

Vin	48V
Cin	100μF
Cout	10μF

2. EMC compliance circuit

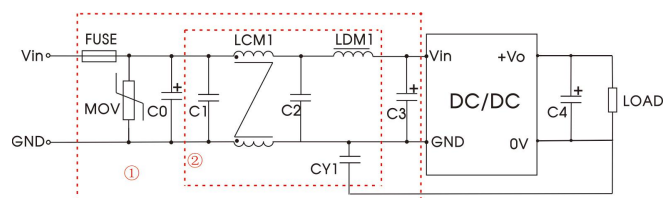


Fig. 3

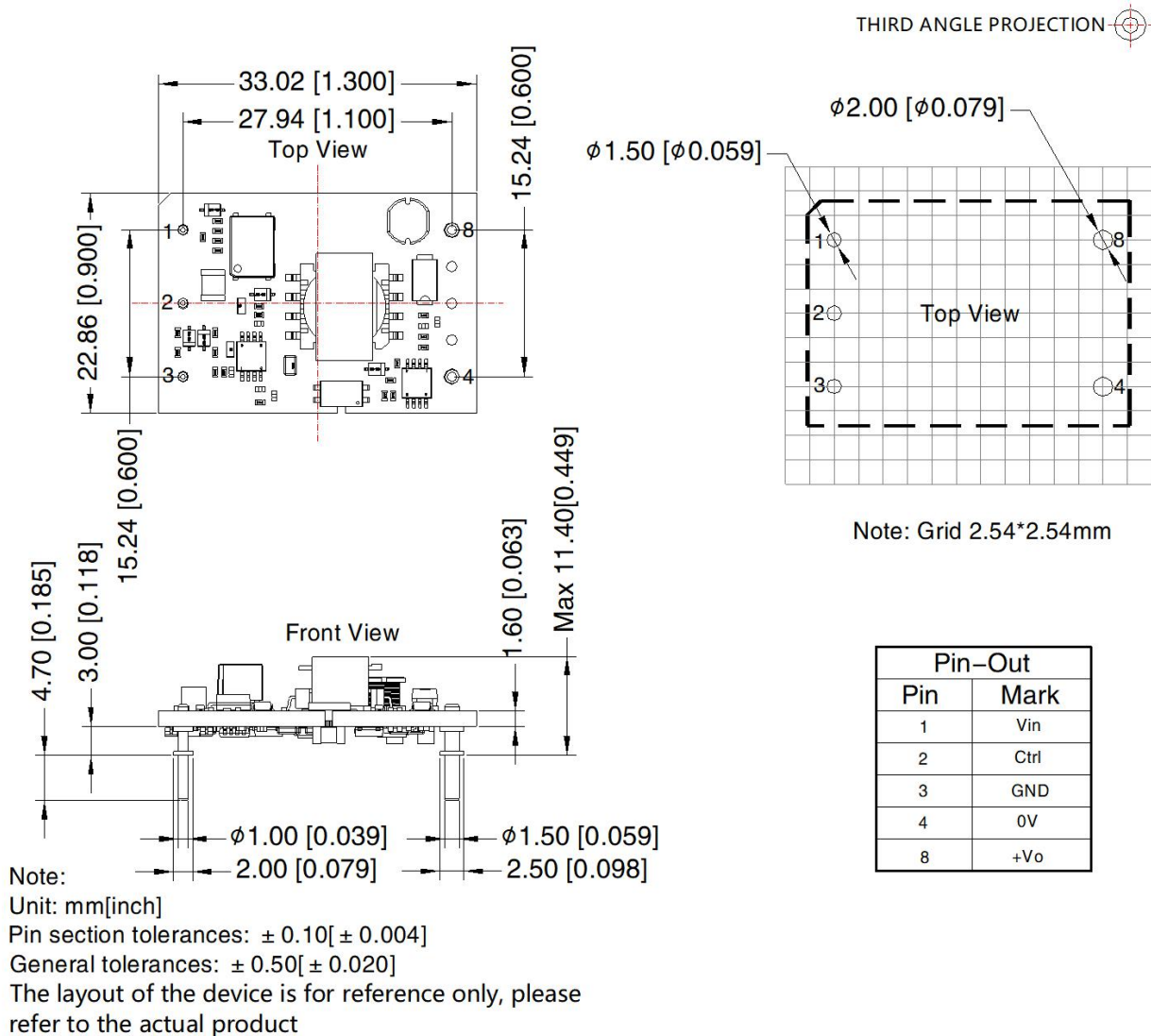
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Parameter description:

Model	Vin:48V
FUSE	Select fuse value according to actual input current
MOV	S14K60
C0	680uF/100V
C1, C2	4.7uF/100V
C3	330μF/100V
C4	Refer to the Cout in Fig.2
LCM1	4.7mH, recommended to use MORNSUN FL2D-30-472
LDM1	10 uH
CY1	1nF/2KV

- The products do not support parallel connection of their output
- For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210102;
- 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 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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