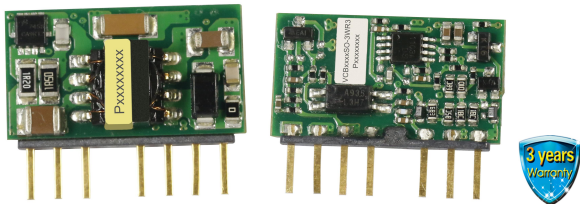


3W isolated DC-DC converter in SIP Package,
wide input and regulated single output



CE Patent Protection RoHS

FEATURES

- Wide 2:1 input voltage range
- High efficiency up to 82%
- No-load power consumption as low as 0.19W
- 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
- Meets EN62368 standard

VCB48_SO-3WR3 series of isolated 3W DC-DC converter products with a wide 2:1 input voltage range. They feature efficient of up to 82%, 1500VDC input to output isolation, operating ambient temperature range of -40°C to +85°C, input under-voltage protection, output short-circuit, over-current protection. They are widely used in communication fields, such as FSU, battery online monitoring, DC meter, environmental monitoring and other micro base station equipment.

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.		
CE	VCB4805SO-3WR3	48 (36-75)	80	5	600/0	78/80	1000
	VCB4812SO-3WR3			12	250/0	79/81	470
	VCB4815SO-3WR3			15	200/0	80/82	330
	VCB4824SO-3WR3			24	125/0	80/82	100

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

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/ no-load)		--	78/4	80/12	mA
Reflected Ripple Current		--	50	100	
Surge Voltage (1sec. max.)		-0.7	--	80	VDC
Start-up Voltage		--	--	36	
Start-up Current		--	--	500	mA
Input Under-voltage Protection		25	28	--	VDC
Input Filter		Capacitance filter			
Hot Plug		Unavailable			
Ctrl ^①	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: ① 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	--	±0.5	±1		
Load Regulation ^①	5%-100% load	--	±0.5	±1.5		
Transient Recovery Time	25% load step change, Nominal input voltage	--	300	500	μs	
Transient Response Deviation		5VDC output	--	±5	±8	%
		Others	--	±2.5	±5	
Temperature Coefficient	Full load	--	--	±0.03	%/°C	

Ripple & Noise	20MHz bandwidth, 5%-100% load	--	100	200	mVp-p
Over-current Protection	Input voltage range	110	160	250	%Io
Short-circuit Protection		Continuous, self-recovery			
Note: ① Load regulation for 0%-5% load is $\pm 3\%$;					

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	--	2200	--	pF
Operating Temperature	See Fig. 1	-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	--	--	+260	
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency *	PWM mode	--	460	--	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.

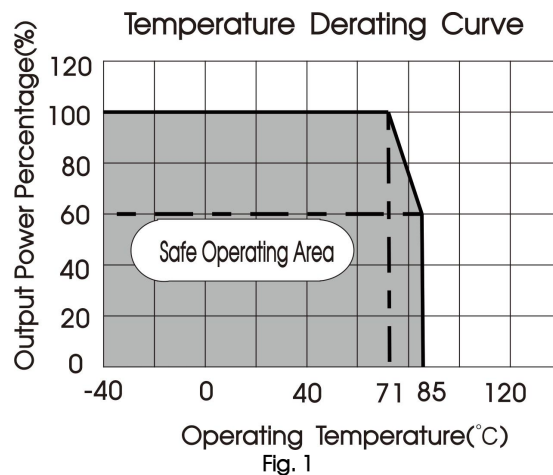
Mechanical Specifications

Dimensions	22.00 x 8.20 x 12.80 mm
Weight	2.2g (Typ.)
Cooling Method	Free air convection or forced 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 ± 4 KV perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A
	EFT	IEC/EN61000-4-4	± 2 KV (see Fig.3-① for recommended circuit) perf. Criteria B
	Surge	IEC/EN61000-4-5	± 2 KV (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 the 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

$C_{in}(\mu F)$	$C_{out}(\mu F)$
100	22

2. EMC compliance circuit

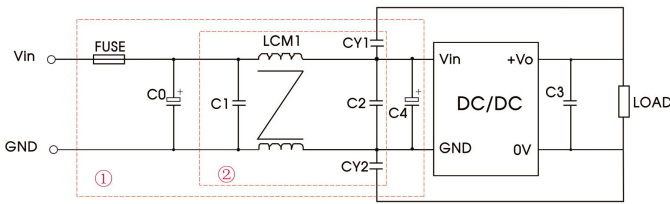


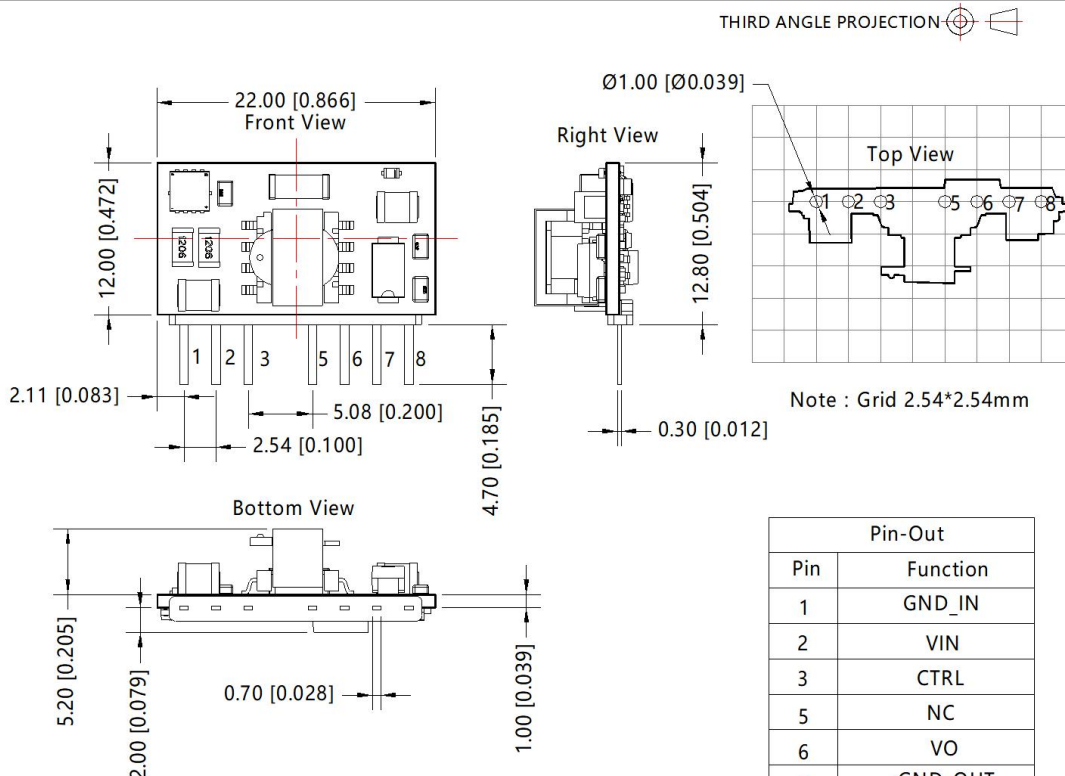
Fig. 3

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

Parameter description

Model	$V_{in}:48V$
FUSE	Choose according to actual input current
C_0, C_4	470 $\mu F/100V$
C_1, C_2	10 $\mu F/100V$
C_3	22 $\mu F/100V$
LCM1	4.22mH (F12D-10-472)
CY1, CY2	1nF/400VAC

Dimensions and Recommended Layout



THIRD ANGLE PROJECTION

Note : Grid 2.54*2.54mm

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: $\pm 0.50[\pm 0.020]$
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. The Packaging bag number of Horizontal package: 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 $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on 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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