

3W isolated DC-DC converter in SIP package
Ultra-wide input and regulated single output



RoHS



FEATURES

- Ultra-wide 4:1 input voltage range
- High efficiency up to 77%
- I/O isolation test voltage 1500 VDC
- Input under-voltage protection, output short circuit, over-current protection
- Operating ambient temperature range: -40°C to +85°C
- Industry standard pin-out

URB4805S-3WR3 is isolated 3W DC-DC products with a 4:1 input voltage range with efficiencies of up to 77%, 1500VDC input to output isolation and the converter safely operate ambient temperature range of -40°C to +85°C, input under-voltage protection, output over-current, short circuit protection. It is ideally and widely used in applications such as industrial control, electric power, instruments and communications.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency® Min./Typ.	Max. Capacitive Load (µF)
		Nominal (Range)	Max. ①	Voltage(VDC)	Current (mA) (Max./Min.)		
--	URB4805S-3WR3	48 (18-75)	75	5	600/30	75/77	1000

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	--	81/10	83/20	mA
Reflected Ripple Current		--	150	--	
Start-up Voltage		--	--	18	VDC
Input Under-voltage Protection		12	15.5	--	
Start-up Time	nominal input voltage	--	10	80	ms
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	--	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	±2	%
Linear Regulation	Input voltage variation from low to high at full load	--	±0.5	±1	
Load Regulation	5% -100% load	--	±1	±2	
Transient Recovery Time	25% load step change, nominal input voltage	--	300	500	µs
Transient Response Deviation	25% load step change, input voltage range	--	±5	±8	%
Temperature Coefficient	Full load	--	--	±0.03	%/°C
Ripple & Noise ①	20MHz bandwidth, 5% -100% load	--	80	150	mV p-p
Over-current Protection		110	160	250	%Io
Short-circuit Protection		Continuous, self-recovery			

Note:

- ①Ripple & Noise at ≤ 5% load is no more than 250mV. The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.

General Specification

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 insulation at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100KHz/0.1V	--	1000	--	pF
Operating Temperature	See Fig. 1	-40	--	+85	°C
Storage Humidity	Without condensation	5	--	95	%RH
Storage Temperature		-55	--	+125	°C
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	
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

Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)
Dimensions	22.0 x 9.5 x 12.0 mm
Weight	4.5g
Cooling method	Free air convection

Electromagnetic Compatibility (EMC)

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

Typical Characteristic Curves

Temperature Derating Curve

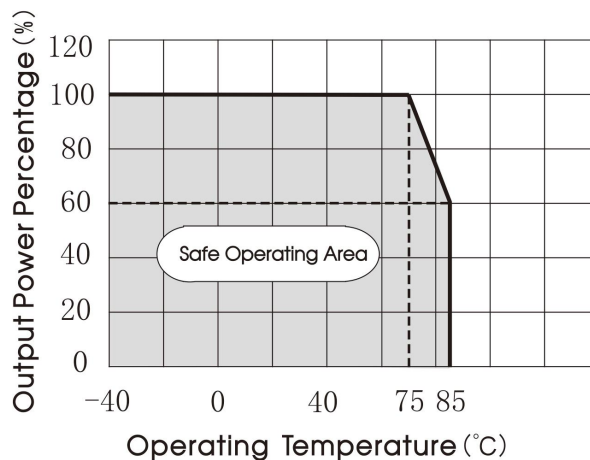


Fig. 1

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

Vout (VDC)	Cin(uF)	Cout(uF)
5	100	10

2. Reflected Ripple Current test

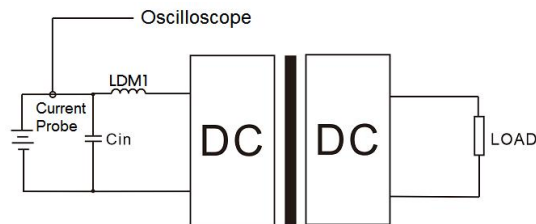


Fig. 3

Parameter description:

Model	Vin:48V
Cin	220µF/100V
LDM1	4.7µH

3. EMC compliance circuit

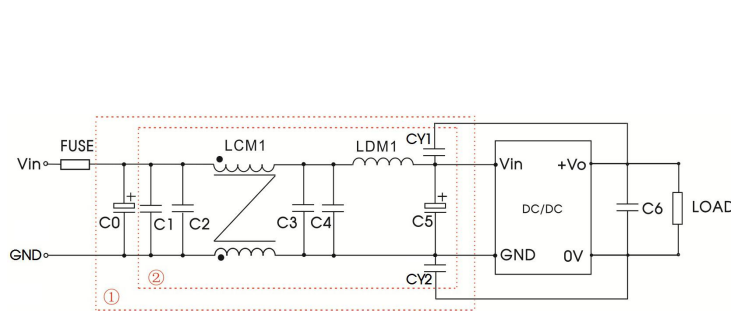


Fig. 4

Notes: For EMC tests we use Part ① in Fig. 4 for immunity and part ② for emissions test. Selecting based on needs

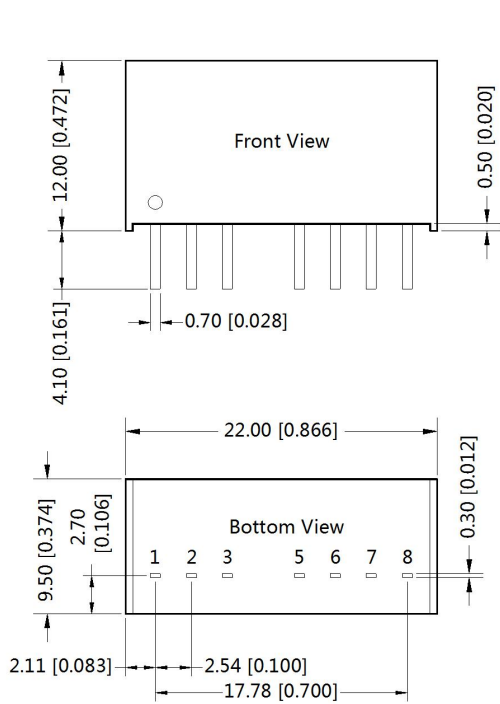
Parameter description:

Model	Vin:48V
FUSE	Choose according to actual input current
C0	680µF/100V
C5	100µF/100V
C1/C2/C3/C4	470nF/100V
LCM1	2.2mH, recommended to use MORNSUN P/N: FL2D-30-222
LDM1	4.7µH
C6	10µF/16V
CY1/CY2	1nF/250VAC

4. It is not allowed to connect modules output in parallel to enlarge the power

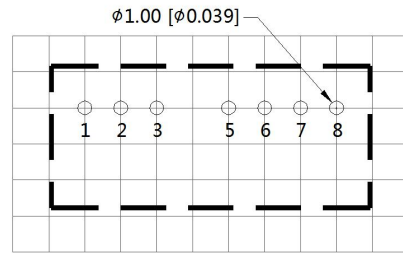
5. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin section tolerances: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.50[\pm 0.020]$

THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
3	Ctrl
5	NC
6	+Vo
7	0V
8	NC

NC: Pin to be isolated from circuitry

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. packaging number: 58210004;
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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