MORNSUN®

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℃ to +85℃
- 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℃ to +85℃, 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.

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Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency② 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	%/℃
Ripple & Noise①	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	℃
Storage Humidity	Without condensation	5	--	95	%RH
Storage Temperature		-55	--	+125	℃
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℃	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

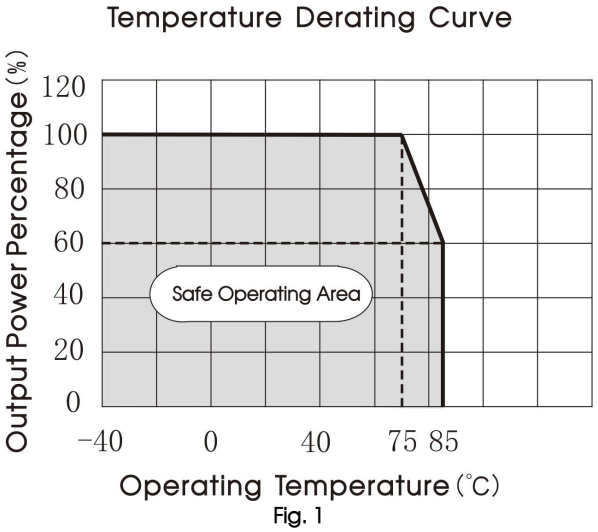


Fig. 1

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 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

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

2. Reflected Ripple Current test

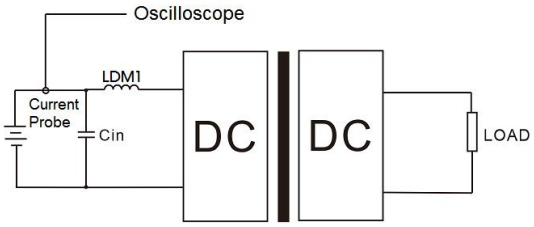


Fig. 3

Parameter description:

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

3. EMC compliance circuit

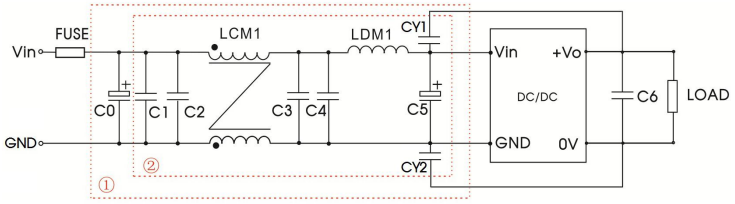


Fig. 4

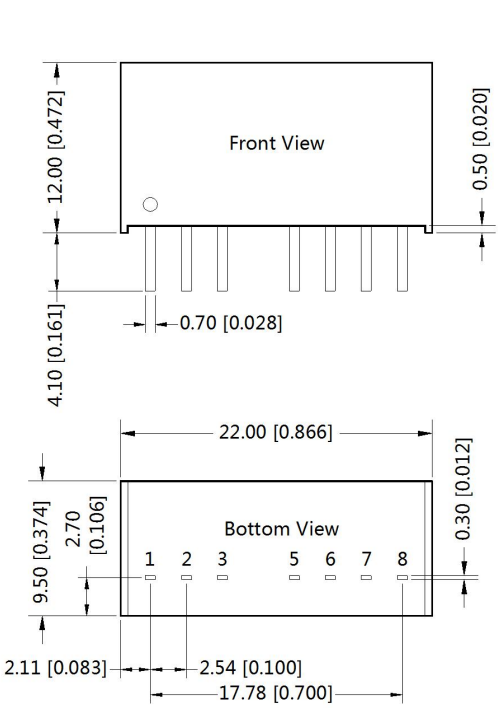
Notes: For EMC tests we use Part ① in Fig. 4 for immunity and part ② for emissions test. Selecting based on needs

Parameter description:

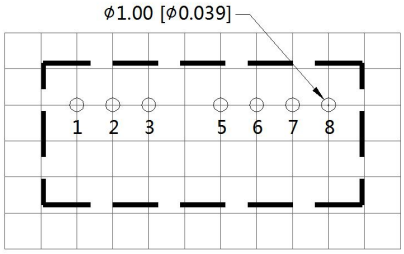
Model	Vin:48V
FUSE	Choose according to actual input current
C0	680uF/100V
C5	100uF/100V
C1/C2/C3/C4	470nF/100V
LCM1	2.2mH, recommended to use MORNSUN P/N: FL2D-30-222
LDM1	4.7uH
C6	10uF/16V
CY1/CY2	1nF/250VAC

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: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]



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 Ta=25℃, 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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