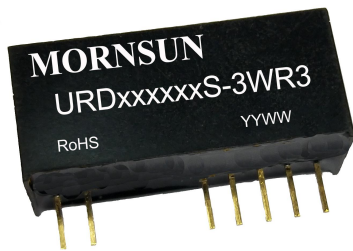


3W, Ultra wide input, dual isolated & regulated dual output, SIP package, DC-DC converter



Patent Protection RoHS

URD\_S-3WR3 series are isolated 3W DC-DC products with 4:1 input voltage, 3000VDC isolation, operating temperature of -40°C to +85°C, input under-voltage protection, over-current, short circuit protection and EMI meets CISPR32/EN55032 CLASS B, which make them widely applied in data transmission device, Tele-communication device, distributed power supply system, remote control system, industrial robot system fields.

## FEATURES

- Ultra wide input voltage range (4:1)
- No-load power consumption as low as 0.2W
- Isolation voltage : 3K VDC
- Input under-voltage protection, output short circuit, over-current protection
- Operating temperature range: -40°C to +85°C
- Meets EN62368 standards

## Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output (Primary output/Secondary output)			Efficiency <sup>②</sup> (%Min./Typ.) @ Full Load	Max. Capacitive Load (μF) (Primary output/Secondary output)
		Nominal (Range)	Max. <sup>①</sup>	Output Voltage (VDC)	Output Current (mA) (Max.)	Output Current (mA) (Min.)		
--	URD480505S-3WR3	48 (18-75)	80	5/5	300/300	0/0	76/78	680/680
	URD480512S-3WR3			5/12	300/125	0/0	76/78	680/330
	URD480524S-3WR3			5/24	300/63	0/0	76/78	680/220

Notes:

- ① Absolute maximum rating without damage on the converter, but it isn't recommended;  
 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)	Nominal input voltage	--	81/5	83/12	mA
Reflected Ripple Current	Nominal input voltage	--	30	--	
Surge Voltage (1sec. max.)		-0.7	--	100	VDC
Starting Voltage		--	--	18	
Input Under-voltage Protection		12	15	--	
Starting Time	Nominal input & constant resistance load	--	10	--	ms
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy	10% -100% load	Primary Output	--	±1	±3	%
		Secondary Output	--	±3	±5	
	5% -10% load	Primary Output	--	±2	±4	
		Secondary Output	--	±4	±6	
Line Regulation <sup>①</sup>	Full load, the input voltage is from low voltage to high voltage	Primary Output	--	±0.2	±0.5	%
		Secondary Output	--	±0.5	±1	
Load Regulation	10% -100% load	Primary Output	--	±0.5	±1	%
		Secondary Output	--	±1	±2	
Cross Regulation	Main output 50% load, Supplement output from 25% to 100% load	--	--	±8		
Transient Recovery Time	25% load step change, nominal input voltage	--	300	500	μs	
Transient Response Deviation <sup>②</sup>		--	±5	±8	%	
Temperature Coefficient	Full load	--	--	±0.03	%/°C	

Ripple & Noise <sup>③</sup>	20MHz bandwidth,nominal input, full load	Primary Output	--	70	150	mV p-p
		Secondary Output	--	100	150	
Over-current Protection <sup>④</sup>	Input voltage range		110	--	250	%Io
Short circuit Protection <sup>⑤</sup>		Hiccup,continuous, self-recovery				

Note: ①When testing from 0% -100%load working conditions, load regulation index of  $\pm 5\%$ ;  
 ②Dynamic load only for primary output.  
 ③Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation;  
 ④Dual output with balanced-load;  
 ⑤Any short circuit,two lines of the output enter burping protection;main output need to on 10%-100% load,secondary output can be short-circuited;  
 secondary output need to on 0%-100% load,primary output can be short-circuited

### General Specification

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Insulation Voltage	with the test time of 1 minute and the leak current lower than 1mA	Input-output	3000	--	--	VDC
		output-output	1500	--	--	
Insulation Resistance	Input-output, insulation voltage 500VDC/min ,25°C ,75%RH	1000	--	--	M $\Omega$	
Isolation Capacitance	Input-output, 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 Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 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 ,full load	1000	--	--	K hours	

Note:\* This series of products using reduced frequency technology, the switching frequency is test value of full load.When the load is reduced to below 50%, the switching frequency decreases with decreasing load.

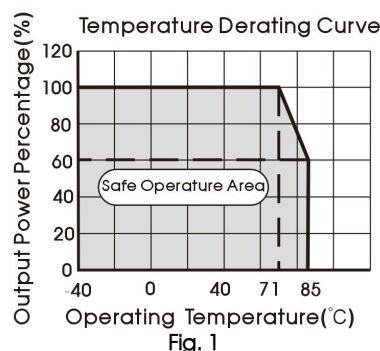
### Physical Specifications

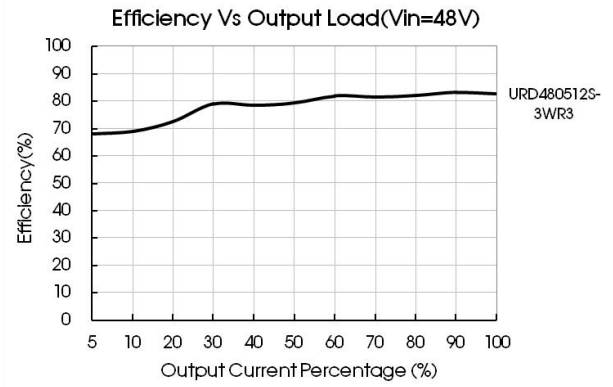
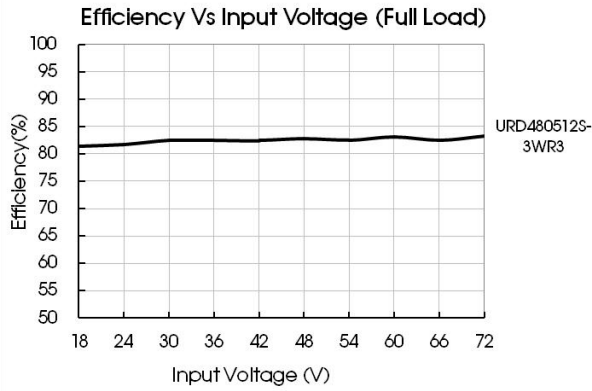
Casing Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)
Dimension	27.40*9.50*12.00mm
Weight	5.43 (Typ.)
Cooling method	Free air convection

### EMC Specifications

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

### Product Characteristic Curve





## Design Reference

### 1. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery. If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors  $C_{in}$  and  $C_{out}$  or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitor load of the product.



Fig. 2

Output voltage(VDC)	$C_{in}(\mu F)$	$C_{out}(\mu F)$
5	47	100
12	22	
24	22	

### 2. EMC solution-recommended circuit

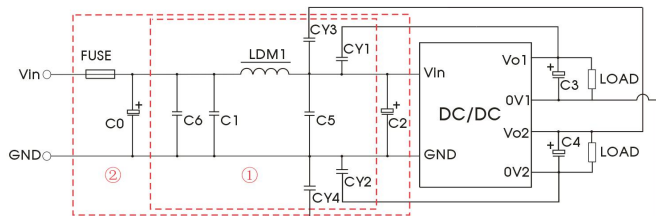


Fig. 3

Notes: Part ① in the Fig. 3 is used for EMI filtering and part ② for EMC test; selected based on needs.

Fig. 3 Parameter description

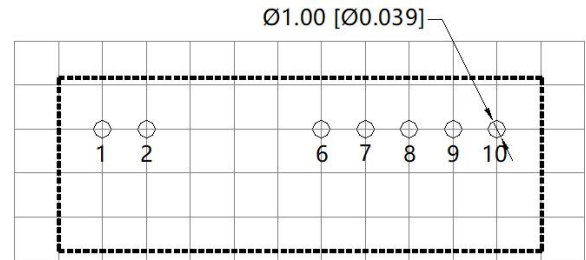
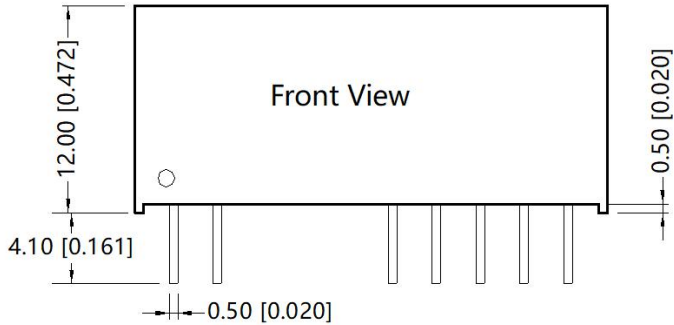
Model	$V_{in}:48V$
FUSE	Choose according to actual input current
C0	680 $\mu F/100V$
C1/C5/C6	4.7 $\mu F/100V$
C2	330 $\mu F/100V$
C3/C4	Refer to the $C_{out}$ in Fig.2
LDM1	22 $\mu H/0.6A$
CY1/CY2/CY4	1nF/3kV
CY3	2.2nF/3kV

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

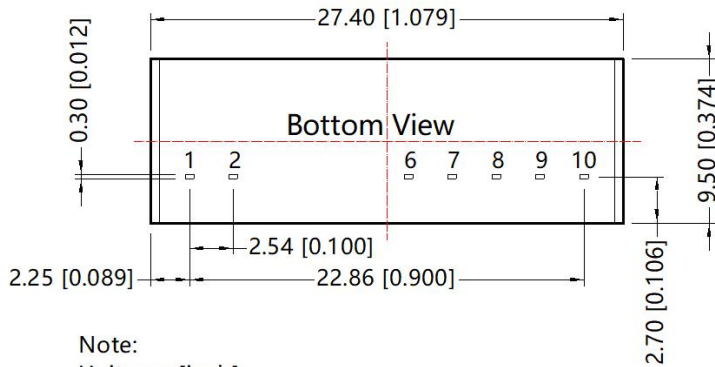
4. For more information please find dc-dc converter application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Note : Grid 2.54\*2.54mm



Pin-Out	
Pin	Function
1	GND
2	Vin
6	+Vo1
7	0V1
8	CS
9	0V2
10	+Vo2

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

Note:

1. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com).Packing bag number : 58210015;
2. The maximum capacitor 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's 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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