

10W isolated DC-DC converter in DIP package
Ultra-wide input and regulated dual output



FEATURES

- Ultra-wide 4:1 input voltage range
- High efficiency up to 84%
- Low no-load power consumption
- Operating ambient temperature range: -40°C to +85°C
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Industry standard pin-out

URD48_YMD-10WR3 10W series of isolated 10W DC-DC converter products feature an ultra-wide 4:1 input voltage with efficiencies of up to 84%, 1500VDC input to output isolation, input under-voltage protection, output short-circuit, over-voltage, over-current protection, which makes them widely used in industrial control, electric power, instruments and communications applications.

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.			
				Vo1	Vo2	Vo1	Vo2		
EN/BS EN	URD480505YMD-10WR3	48 (18-75)	80	5	5	1000	1000	81/84	1000/1000
	URD480512YMD-10WR3			5	12	1000	417	82/84	1000/470
	URD480524YMD-10WR3			5	24	1000	209	82/84	1000/100

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)	Nominal input voltage	--	248/4	258/10	mA
Reflected Ripple Current	Nominal input voltage	--	30	--	
Surge Voltage (1sec. max.)		-0.7	--	100	VDC
Start-up Voltage		--	--	18	
Under-voltage Protection		12	15.5	--	
Input Filter		Pi filter			
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	--	3	10	mA
Hot Plug		Unavailable			

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

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Voltage Accuracy	0%-100% load	Vo1	--	±1	±3	%
	Input voltage, any balanced load	Vo2	--	±3	±6	
Linear Regulation	Full load, Input voltage variation from low to high, dual output	Vo1	--	±0.3	±0.5	
		Vo2	--	±2	±3	
Load Regulation	10%-100% load, dual output, balanced power	Vo1	--	±0.5	±1	
		Vo2	--	±3	±6	

Transient Recovery Time ^①	25% load step change, nominal input voltage	--	300	500	μs
Transient Response Deviation ^①		--	±5	±8	%
Temperature Coefficient	Full load	--	--	±0.03	%/°C
Ripple & Noise ^②	5%-100% load	--	75	150	mV p-p
Over-voltage Protection	Input voltage range	110	--	160	%Vo
Over-current Protection ^③		110	150	200	%Io
Short-circuit Protection ^④		Continuous, self-recovery			

Note:
 ①Dynamic load only for Vo1;
 ②The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information;
 ③Dual output with balanced-load;
 ④Any load short circuit, the two outputs both go into hiccup protection; The Vo2 could be short circuit only Vo1 with load(10%-100%); The Vo1 could be shorted under condition of Vo2 load of 0%-100%.

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
	Vo1-Vo2 Electric Strength Test for 1 minute with a leakage current of 1mA max.	500	--	--	
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
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	°C
Vibration		10-150Hz, 5G, 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	Aluminum alloy
Dimensions	25.40 x 25.40 x 11.70 mm
Weight	13.0g (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 / Air ±6kV	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	10 Vr.m.s	perf. Criteria A

Typical Characteristic Curve

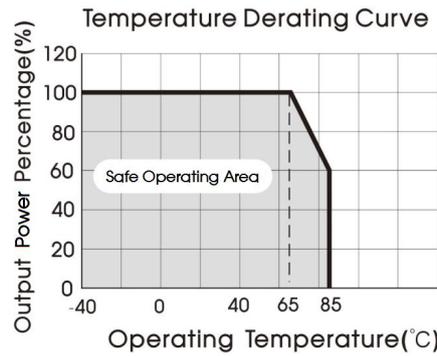
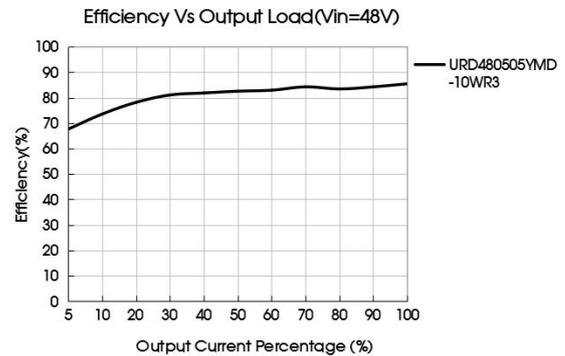
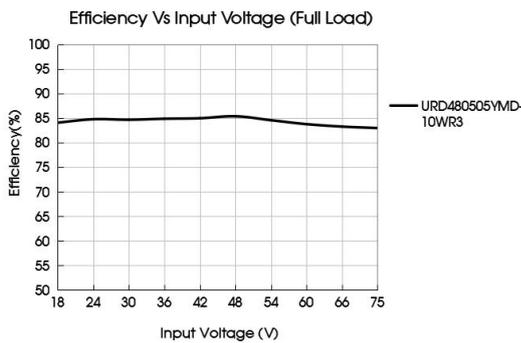


Fig. 1 (Vin=48V)



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 max. capacitive load value of the product.



Fig. 2

Vout (VDC)	Cin	Cout
5	100 μ F/100V	100 μ F/16V
12		22 μ F/25V
24		22 μ F/50V

2. EMC compliance circuit

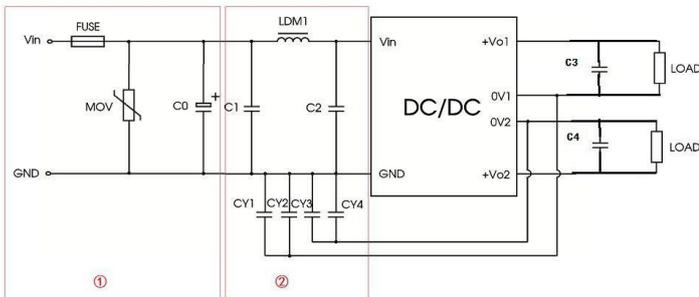


Fig. 3

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

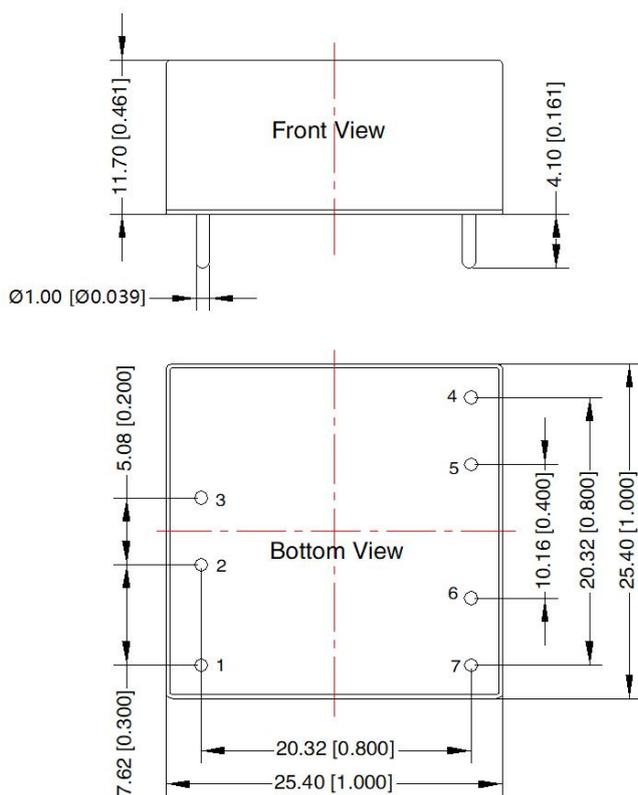
List of components:

Model	Vin: 48VDC
FUSE	Choose according to actual input current
MOV	S14K60
C0	330 μ F/100V
C1/ C2	4.7 μ F/100V
C3/ C4	Refer to the Cout in Fig.2
LDM1	15uH
CY1/ CY2/ CY3/ CY4	2.2nF/2000V

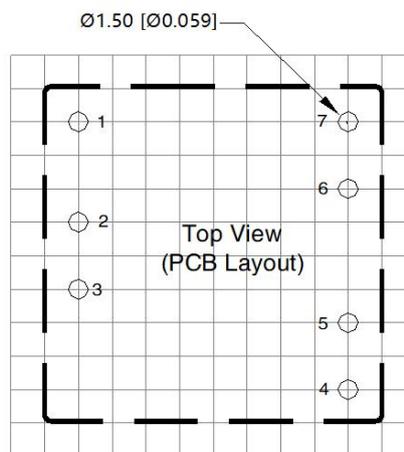
3. The products do not support parallel connection of their output

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

Dimensions and Recommended Layout



THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	Ctrl
2	GND
3	Vin
4	+Vo2
5	0V2
6	0V1
7	+Vo1

Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10 [± 0.004]
General tolerances: ± 0.50 [± 0.020]

- Note:
- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210003 ;
 - 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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