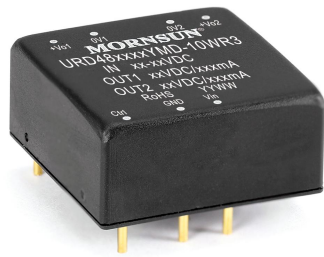


10W isolated DC-DC Converter in DIP package with Ultra-wide Input and Regulated Dual Output



Patent Protection RoHS

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 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 over-current, over-voltage, short circuit protection, which makes them widely used in industrial control, electric power, instruments and communications applications.

Selection Guide

| Part No. | Input Voltage (VDC) | | Output | | | | Full Load Efficiency ^② (%) Min./Typ. | Capacitive Load(μF) Max. Primary (Vo1)/ Secondary (Vo2) |
|--------------------|---------------------|-------------------|---------------|-----------------|------------------------|-----------------|--|---|
| | Nominal (Range) | Max. ^① | Voltage (VDC) | | Current (mA) Max./Min. | | | |
| | | | Primary (Vo1) | Secondary (Vo2) | Primary (Vo1) | Secondary (Vo2) | | |
| 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 Absolute maximum stress rating without damage (not 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 | -- | 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 switch on | Ctrl suspended or connected to TTL high level (3.5-12VDC) | | | |
| | Module switch off | Ctrl pin connected to GND or low level (0-1.2VDC) | | | |
| | Input current when switched 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 | -- | ±1 | ±3 | % | |
| | Input voltage, any balanced load | -- | ±3 | ±6 | | |
| Linear Regulation | Input voltage variation from low to high at full load | Primary output | -- | ±0.3 | | ±0.5 |
| | | Secondary output | -- | ±2 | | ±3 |
| Load Regulation | 10%-100% load, Dual output, balanced power | Primary output | -- | ±0.5 | ±1 | |
| | | Secondary output | -- | ±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 primary output.
 ②Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation;
 ③Dual output with balanced-load;
 ④Any 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 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 |
| | Primary-Secondary 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, 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 |

Product Characteristic Curves

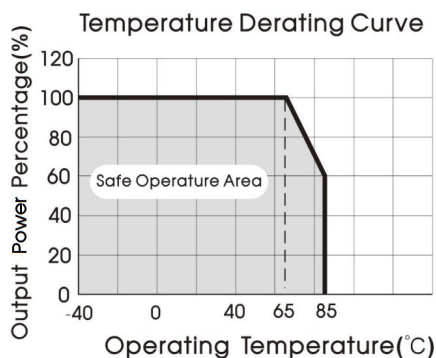
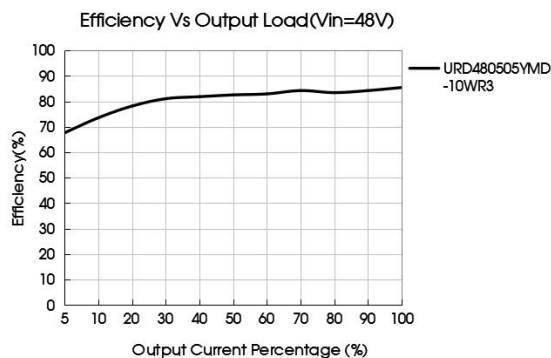
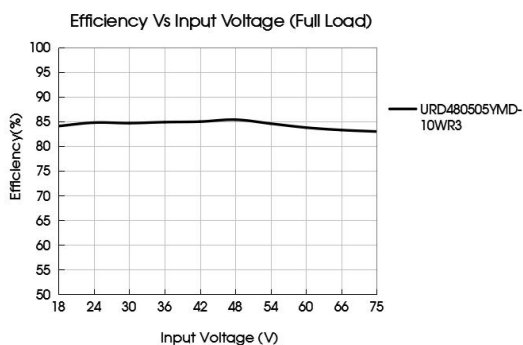


Fig. 1 (Vin=48V)



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

| Vou t(VDC) | Cin (μF) | Cout (μF) |
|------------|----------|-----------|
| 5 | 100 | 100 |
| 12 | 100 | 22 |
| 24 | 100 | 22 |

2. EMC compliance circuit

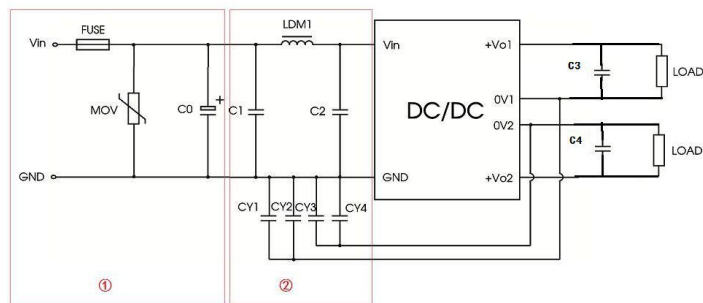


Fig. 3

Notes: Part ① in the Fig. 3 is used for EMS test and part ② for EMI test

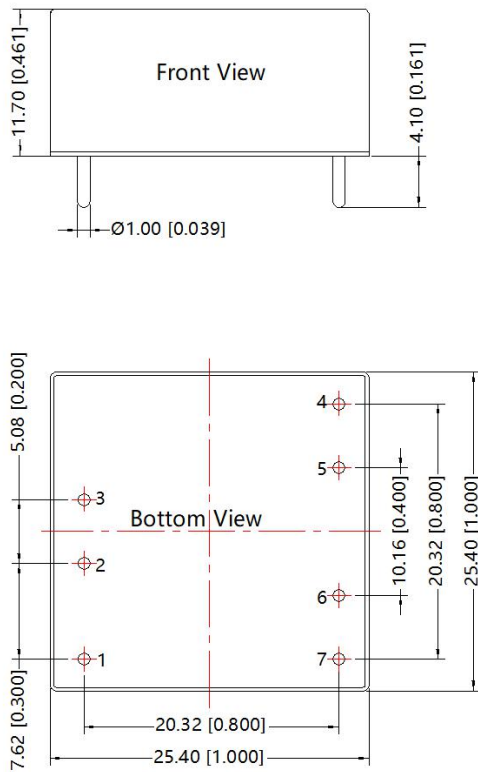
List of components:

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

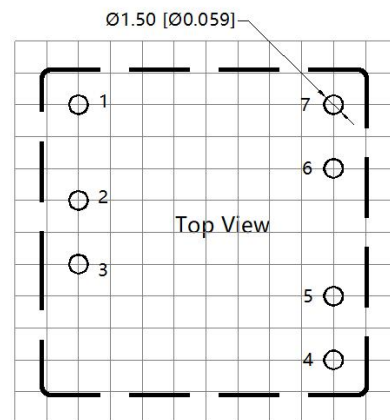
3. The products do not support parallel connection of their output

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 | Function |
| 1 | Ctrl |
| 2 | GND |
| 3 | Vin |
| 4 | +Vo2 |
| 5 | 0V2 |
| 6 | 0V1 |
| 7 | +Vo1 |

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

- 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's 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.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Luogang District, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: sales@mornsun.cn www.mornsun-power.com