

WRA_YMD-6W & WRB_YMD-6W Series

6W, WIDE INPUT ISOLATED & REGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER

multi-country patent protection **RoHS**

FEATURES

- DIP Package
- Operating Temperature: -40°C to +85°C
- 1.5KVDC Isolation
- Metal Case Package
- No Heat sink Required
- Industry Standard Pin out
- MTBF>1,000,000 hours
- RoHS Compliance

APPLICATIONS

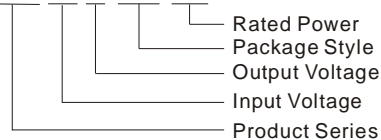
The WRA_YMD-6W/WRB_YMD-6W Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is wide range (voltage range $\leq 2:1$);
- 2) Where isolation is necessary between input and output (Isolation voltage $\leq 1500\text{VDC}$);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

MODEL SELECTION

WRA2415YMD-6W



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PRODUCT PROGRAM

| Part Number | Input | | | Output | | | Efficiency (% Typ) |
|-----------------|---------------|-------|-------|---------------|--------------|-----|--------------------|
| | Voltage (VDC) | | | Voltage (VDC) | Current (mA) | | |
| | Nominal | Range | Max** | | Max | Min | |
| WRA0505YMD-6W * | 5 | 4.5-9 | 11 | ±5 | ±600 | ±60 | 76 |
| WRA0512YMD-6W * | | | | ±12 | ±250 | ±25 | 80 |
| WRA0515YMD-6W * | | | | ±15 | ±200 | ±20 | 82 |
| WRB0505YMD-6W | | | | 5 | 1200 | 120 | 76 |
| WRB0512YMD-6W * | | | | 12 | 500 | 50 | 80 |
| WRB0515YMD-6W * | | | | 15 | 400 | 40 | 82 |
| WRA1205YMD-6W * | 12 | 9-18 | 20 | ±5 | ±600 | ±60 | 79 |
| WRA1212YMD-6W * | | | | ±12 | ±250 | ±25 | 82 |
| WRA1215YMD-6W * | | | | ±15 | ±200 | ±20 | 84 |
| WRA1224YMD-6W * | | | | ±24 | ±125 | ±13 | 82 |
| WRB1205YMD-6W | | | | 5 | 1200 | 120 | 79 |
| WRB1212YMD-6W | | | | 12 | 500 | 50 | 82 |
| WRB1215YMD-6W * | | | | 15 | 400 | 40 | 84 |
| WRB1224YMD-6W * | | | | 24 | 250 | 25 | 82 |
| WRA2405YMD-6W | 24 | 18-36 | 40 | ±5 | ±600 | ±60 | 80 |
| WRA2412YMD-6W | | | | ±12 | ±250 | ±25 | 84 |
| WRA2415YMD-6W | | | | ±15 | ±200 | ±20 | 86 |
| WRA2424YMD-6W | | | | ±24 | ±125 | ±13 | 84 |
| WRB2403YMD-6W * | | | | 3.3 | 1500 | 150 | 78 |
| WRB2405YMD-6W | | | | 5 | 1200 | 120 | 80 |
| WRB2412YMD-6W | | | | 12 | 500 | 50 | 84 |
| WRB2415YMD-6W | | | | 15 | 400 | 40 | 86 |
| WRB2424YMD-6W | | | | 24 | 250 | 25 | 85 |
| WRA4805YMD-6W | | | | 48 | 36-72 | 80 | ±5 |
| WRA4812YMD-6W | ±12 | ±250 | ±25 | | | | 84 |
| WRA4815YMD-6W | ±15 | ±200 | ±20 | | | | 85 |
| WRA4824YMD-6W * | ±24 | ±125 | ±13 | | | | 86 |
| WRB4803YMD-6W * | 3.3 | 1500 | 150 | | | | 78 |
| WRB4805YMD-6W | 5 | 1200 | 120 | | | | 80 |
| WRB4812YMD-6W | 12 | 500 | 50 | | | | 84 |
| WRB4815YMD-6W | 15 | 400 | 40 | | | | 86 |
| WRB4824YMD-6W | 24 | 250 | 25 | 85 | | | |

* Designing.

** Input voltage can't exceed this value, or will cause the permanent damage.

OUTPUT SPECIFICATION

| Item | Test Conditions | Min | Typ | Max | Units |
|-------------------------------|----------------------------------|-----|------|------|-------|
| Output Power | See above products program | 0.6 | | 6 | W |
| Positive Voltage Accuracy | Refer to recommended circuit | | ±1 | ±3 | % |
| Negative Voltage Accuracy | Refer to recommended circuit | | ±3 | ±5 | |
| Load Regulation | From 10% To 100% load | | ±0.5 | ±1* | |
| Line Regulation(at full load) | Input voltage from low to high | | ±0.2 | ±0.5 | |
| Temperature Drift(Vout) | Refer to recommended circuit | | 0.02 | | %/°C |
| Ripple** | 20MHz bandwidth | | 30 | 50 | mVp-p |
| Noise** | 20MHz bandwidth | | 75 | 150 | |
| Switching Frequency | 100% load, nominal Input voltage | | 300 | | KHz |

* Dual output models unbalanced load: ±5%.

** Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

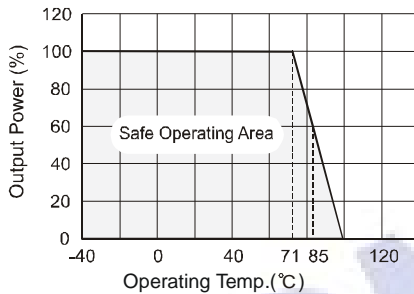
COMMON SPECIFICATIONS

| Item | Test Conditions | Min | Typ | Max | Units |
|---------------------------|---------------------------------|------|------|-----|---------|
| Storage Humidity Range | | | | 95 | % |
| Operating temperature | | -40 | | 85 | °C |
| Storage Temperature | | -55 | | 125 | |
| Lead Temperature | 1.5mm from case for 10 seconds | | | 300 | |
| Temp. Rise at Full Load | | | 40 | | |
| Isolation voltage | Tested for 1 minute and 1mA max | | 1500 | | VDC |
| Isolation resistance | Test at 500VDC | | 1000 | | MΩ |
| Isolation capacitance | Input/Output | | 100 | | pF |
| No-load Power Consumption | | | 500 | | mW |
| Cooling | Free Air Convection | | | | |
| Short Circuit Protection | Continuous, automatic recovery | | | | |
| Case Material | Aluminium alloy | | | | |
| MTBF | | 1000 | | | K hours |
| Weight | | | 15 | | g |

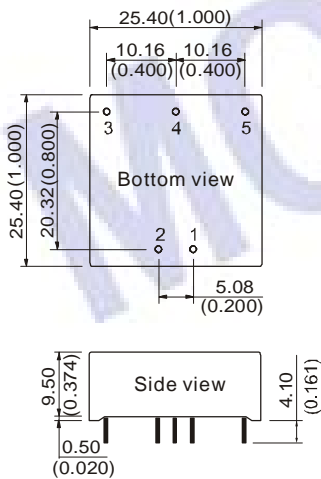
Note:

- All specifications measured at $T_A=25^{\circ}\text{C}$, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- See below recommended circuits for more details.

TYPICAL CHARACTERISTICS



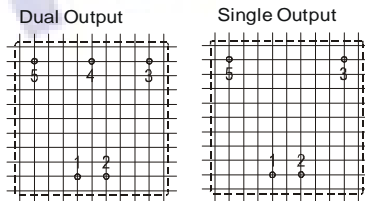
OUTLINE DIMENSIONS & FOOTPRINT DETAILS



Note:
 Unit:mm(inch)
 Pin diameter:0.80mm(0.031inch)
 Pin diameter tolerances:±0.05mm(±0.002inch)
 General tolerances:±0.25mm(±0.010inch)

First Angle Projection

RECOMMENDED FOOTPRINT
 Top View, grid:2.54mm(0.1inch)
 diameter:1.20mm(0.047inch)

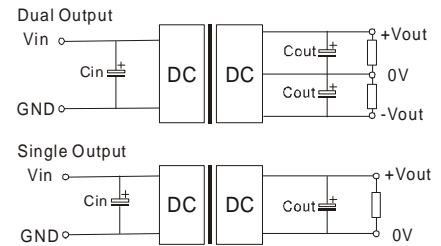


FOOTPRINT DETAILS

| Pin | Single | Dual |
|-----|--------|------|
| 1 | GND | GND |
| 2 | Vin | Vin |
| 3 | +Vo | +Vo |
| 4 | No Pin | 0V |
| 5 | 0V | -Vo |

Recommended Circuit

All the WRA_YMD-6W & WRB_YMD-6W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load. Never be tested under no load (see Figure 1).



(Figure 1)

If you want to further decrease the output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high.(Table 1).

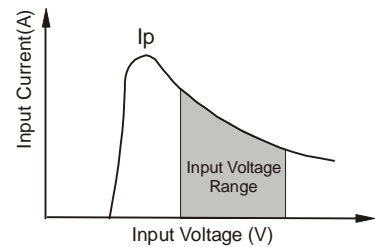
External Capacitor Table(Table 1)

| Vin (VDC) | Cin (uF) | Single Vout (VDC) | Cout (uF) max | Dual Vout (VDC) | Cout (uF) max |
|-----------|----------|-------------------|---------------|-----------------|---------------|
| 5 | 100 | 3.3 | 2200 | ±5 | 680 |
| 12 | 100 | 5 | 1000 | ±9 | 470 |
| 24 | 10-47 | 9 | 680 | ±12 | 330 |
| 48 | 10-47 | 12 | 470 | ±15 | 220 |
| - | - | 15 | 330 | - | - |
| - | - | 24 | 220 | - | - |

Input Current

When it is used in unregulated power supply, be sure that the fluctuating range of the power supply and the rippled voltage do not exceed the module standard. Input current of power supply should afford the startup current of this kind of DC/DC module. (Figure 2).

General: $I_p \leq 1.6 \cdot I_{in-max}$



(Figure 2)

No parallel connection or plug and play.

APPLICATION NOTE

Requirement on output load

In order to ensure the product operate efficiently and reliably, in addition to a max load (namely full load), a minimum load is specified for this kind of DC/DC converter. Make sure the specified range of input voltage is not exceeded, the minimum output load **no less than 10% load**. If the actual load is less than the specified minimum load, the output ripple may increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, please add an appropriate resistor as extra loading, or contact our company for other lower output power products.