

## FEATURES

- ◆24-PIN DIP PACKAGE
- ◆WIDE 2:1 INPUT RANGE
- ◆HIGH EFFICIENCY UP TO 80%
- ◆LOW PROFILE METAL PACKAGE
- ◆INPUT/OUTPUT ISOLATION: 3000VDC
- ◆CONTINUOUS SHORT CIRCUIT PROTECTION
- ◆OPERATING TEMPERATURE: -40°C-+85°C
- ◆PIN - COMPATIBLE WITH MULTIPLE MANUFACTURERS

## MODEL SELECTION

**WRE<sup>①</sup>24<sup>②</sup>15<sup>③</sup>Y<sup>④</sup>D<sup>⑤</sup>-5W(167)<sup>⑥</sup>**

- ① Product Series    ② Input Voltage
- ③ Output Voltage    ④ Wide (2:1) Input Range
- ⑤ DIP24 Package Style
- ⑥ Rated Power(Output current)

## APPLICATIONS

The WRE\_YD-5W & WRF\_YD-5W 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  $\leq 3000$ VDC);
- 3) Where the regulation of the Output voltage and the output ripple noise are demanded.



**CE REACH**  
MICRODC RESERVES THE COPYRIGHT

## SELECTION GUIDE

| Order code     | Input Voltage  | Output Voltage | Output Current |
|----------------|----------------|----------------|----------------|
| WRF1203YD-1250 | 9VDC - 18VDC   | 3.3VDC         | 1250mA         |
| WRF1205YD-5W   | 9VDC - 18VDC   | 5VDC           | 1000mA         |
| WRF1207YD-5W   | 9VDC - 18VDC   | 7.2VDC         | 694mA          |
| WRF1209YD-5W   | 9VDC - 18VDC   | 9VDC           | 556mA          |
| WRF1212YD-5W   | 9VDC - 18VDC   | 12VDC          | 417mA          |
| WRF1215YD-5W   | 9VDC - 18VDC   | 15VDC          | 333mA          |
| WRF1218YD-5W   | 9VDC - 18VDC   | 18VDC          | 278mA          |
| WRF1224YD-5W   | 9VDC - 18VDC   | 24VDC          | 208mA          |
| WRF2403YD-1250 | 18VDC - 36VDC  | 3.3VDC         | 1250mA         |
| WRF2405YD-5W   | 18VDC - 36VDC  | 5VDC           | 1000mA         |
| WRF2407YD-5W   | 18VDC - 36VDC  | 7.2VDC         | 694mA          |
| WRF2409YD-5W   | 18VDC - 36VDC  | 9VDC           | 556mA          |
| WRF2412YD-5W   | 18VDC - 36VDC  | 12VDC          | 417mA          |
| WRF2415YD-5W   | 18VDC - 36VDC  | 15VDC          | 333mA          |
| WRF2418YD-5W   | 18VDC - 36VDC  | 18VDC          | 278mA          |
| WRF2424YD-5W   | 18VDC - 36VDC  | 24VDC          | 208mA          |
| WRF4803YD-1250 | 36VDC - 72 VDC | 3.3VDC         | 1250mA         |
| WRF4805YD-5W   | 36VDC - 72 VDC | 5VDC           | 1000mA         |
| WRF4807YD-5W   | 36VDC - 72 VDC | 7.2VDC         | 694mA          |
| WRF4809YD-5W   | 36VDC - 72 VDC | 9VDC           | 556mA          |
| WRF4812YD-5W   | 36VDC - 72 VDC | 12VDC          | 417mA          |
| WRF4815YD-5W   | 36VDC - 72 VDC | 15VDC          | 333mA          |
| WRF4818YD-5W   | 36VDC - 72 VDC | 18VDC          | 278mA          |
| WRF4824YD-5W   | 36VDC - 72 VDC | 24VDC          | 208mA          |
| WRE1203YD-625  | 9VDC - 18VDC   | ±3.3VDC        | ±625mA         |
| WRE1205YD-5W   | 9VDC - 18VDC   | ±5VDC          | ±500mA         |
| WRE1207YD-5W   | 9VDC - 18VDC   | ±7.2VDC        | ±347mA         |
| WRE1209YD-5W   | 9VDC - 18VDC   | ±9VDC          | ±278mA         |
| WRE1212YD-5W   | 9VDC - 18VDC   | ±12VDC         | ±209mA         |
| WRE1215YD-5W   | 9VDC - 18VDC   | ±15VDC         | ±167mA         |
| WRE1218YD-5W   | 9VDC - 18VDC   | ±18VDC         | ±139mA         |
| WRE1224YD-5W   | 9VDC - 18VDC   | ±24VDC         | ±104mA         |
| WRE2403YD-625  | 18VDC - 36VDC  | ±3.3VDC        | ±625mA         |
| WRE2405YD-5W   | 18VDC - 36VDC  | ±5VDC          | ±500mA         |
| WRE2407YD-5W   | 18VDC - 36VDC  | ±7.2VDC        | ±347mA         |
| WRE2409YD-5W   | 18VDC - 36VDC  | ±9VDC          | ±278mA         |
| WRE2412YD-5W   | 18VDC - 36VDC  | ±12VDC         | ±209mA         |
| WRE2415YD-5W   | 18VDC - 36VDC  | ±15VDC         | ±167mA         |
| WRE2418YD-5W   | 18VDC - 36VDC  | ±18VDC         | ±139mA         |
| WRE2424YD-5W   | 18VDC - 36VDC  | ±24VDC         | ±104mA         |
| WRE4803YD-625  | 36VDC - 72VDC  | ±3.3VDC        | ±625mA         |
| WRE4805YD-5W   | 36VDC - 72VDC  | ±5VDC          | ±500mA         |
| WRE4807YD-5W   | 36VDC - 72VDC  | ±7.2VDC        | ±347mA         |
| WRE4809YD-5W   | 36VDC - 72VDC  | ±9VDC          | ±278mA         |
| WRE4812YD-5W   | 36VDC - 72VDC  | ±12VDC         | ±209mA         |
| WRE4815YD-5W   | 36VDC - 72VDC  | ±15VDC         | ±167mA         |
| WRE4818YD-5W   | 36VDC - 72VDC  | ±18VDC         | ±139mA         |
| WRE4824YD-5W   | 36VDC - 72VDC  | ±24VDC         | ±104mA         |

| Input Specifications            |                     |
|---------------------------------|---------------------|
| Voltage range                   | 12VDC, 9~18VDC      |
|                                 | 24VDC, 18~36VDC     |
|                                 | 48VDC, 36~72VDC     |
| Filter                          | p(Pi) Network       |
| Isolation Specifications        |                     |
| Rated voltage (60 sec)          | 3000VDC             |
| Resistance                      | > 1000MOhm          |
| Capacitance                     | 120pF, typ.         |
| Environmental Specifications    |                     |
| Operating temperature (ambient) | -40°C ... +85°C     |
| Storage temperature             | -55°C ... +125°C    |
| Case temperature                | +100°C, max.        |
| Derating                        | None required       |
| Humidity (non-condensing)       | Up to 90%           |
| Cooling                         | Free-air Convection |

MTBF: > 1,009,000 hrs (MIL-HDBK-217F, Ground Benign, t=+25°C)  
Specifications are subject to change without notification

| General Specifications        |                        |
|-------------------------------|------------------------|
| Efficiency                    | 74% to 80%             |
| Switching Frequency           | 250KHz, typ. 100% load |
| Output Specifications         |                        |
| Voltage accuracy              | ±1%, max.              |
| Voltage balance (Dual Output) | ±1%                    |
| Ripple & noise (at 20MHz BW)  | 60mVp-p, max.          |
| Short circuit protection      | Continuous             |
| Short circuit restart         | Automatic              |
| Line voltage regulation       | ±0.5%, max.            |
| Load voltage regulation       | ±0.5%, max.            |
| Temperature coefficient       | ±0.02%/°C, typ.        |
| Physical Specifications       |                        |
| Dimensions                    | 31.75x20.32x10.16mm    |
|                               | 1.25x0.8x0.4inches     |
| Weight                        | 19g                    |
| Case material                 | Nickel-Coated Copper   |

### 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.

#### Recommended Circuit

All the WRE\_YD-5W&WRF\_YD-5W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load (See figure 1).

If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1).

General:                              Cin: 5V & 12V 100μF  
    24V & 48V 100μF-47μF  
    Cout: 10μF/100mA

#### Input current

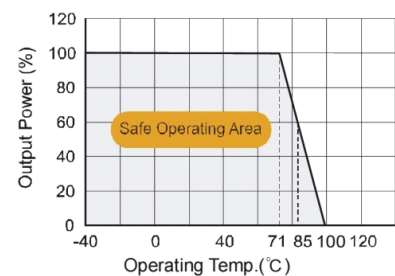
While using unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. Input current of power supply should afford the startup current of this kind of DC/DC module (See figure 2).

General:  $I_p \leq 1.4 * I_{in-max}$

#### No parallel connection or plug and play

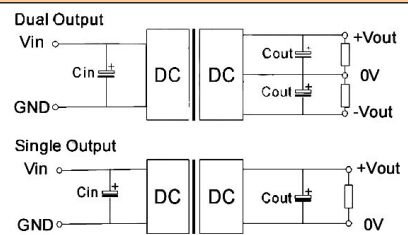
### TYPICAL CHARACTERISTICS

#### Temperature Derating Graph

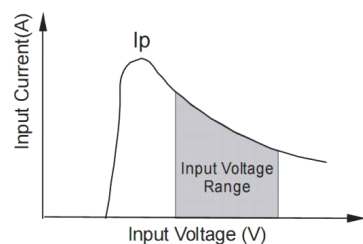


### RECOMMENDED CIRCUIT

#### Output Graph

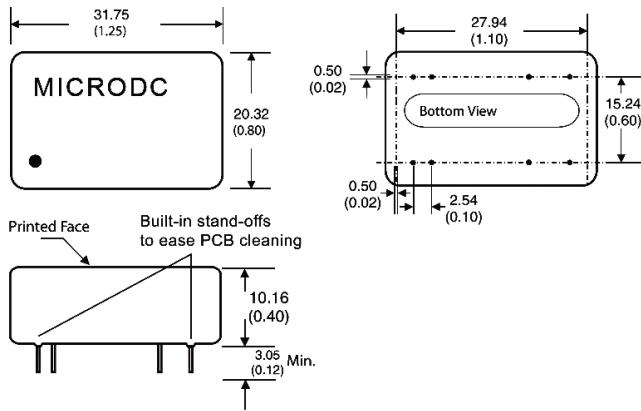


(Figure 1)



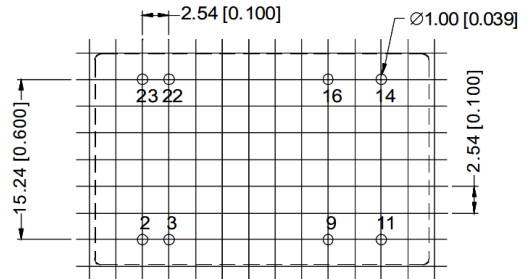
(Figure 2)

### MECHANICAL DIMENSIONS



Note:  
 Unit:mm[inch]  
 Pin section tolerances:±0.10mm[±0.004inch]  
 General tolerances:±0.25mm[±0.010inch]

### RECOMMENDED FOOTPRINT



RECOMMENDED FOOTPRINT  
 Top view grid:2.54mm(0.1inch)  
 diameter:1.00mm(0.039inch)

### FOOTPRINT DETAILS

| Pin   | 3000VDC   |           |
|-------|-----------|-----------|
|       | Single    | Dual      |
| 2、3   | -V Input  | -V Input  |
| 9     | N.C       | Common    |
| 11    | N.C       | -V Output |
| 14    | +V Output | +V Output |
| 16    | -V Output | Common    |
| 22、23 | +V Input  | +V Input  |

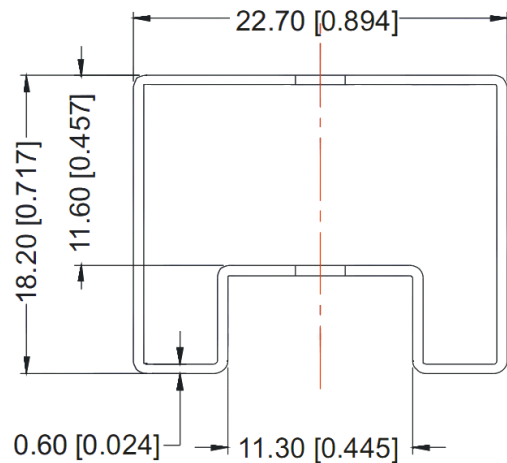
NC:No connection

When the environment temperature is higher than 71°C, the product output power should be less than 60% of the rated power.

No parallel connection or plug and play.

Use dual output simultaneously,forbid pening output pin (0V) to use as single output.

### TUBE OUTLINE DIMENSIONS



Note:  
 Unit :mm[inch]  
 General tolerances:±0.50mm[±0.020inch]  
 L=530mm[20.866inch] Tube Quantity: 15pcs  
 L=220mm[8.661inch] Tube Quantity: 6pcs

Note:

1. The load shouldn't be less than 10%, otherwise ripple will increase dramatically.
2. Operation under 10% load will not damage the converter; However, they may not meet all specification listed.
3. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
4. In this data sheet, all the test methods of indications are based on corporate standards.
5. Only typical models listed, other models may be different, please contact our technical person for more details.