



## FEATURES

- ◆ DIP-24 package with industry Standard footprint
- ◆ Wide 2:1 input voltage range
- ◆ Input filter meets EN 55022, class A
- ◆ Extended operating temperature range:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- ◆ Remote On/Off
- ◆ Shielded metal case with insulated baseplate
- ◆ Lead free design, RoHS compliant
- ◆ 3 Year product warranty

## MODEL SELECTION

**WRB<sup>①</sup> 24<sup>②</sup> 15<sup>③</sup> Y<sup>④</sup> D<sup>⑤</sup>-8W<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

## APPLICATIONS

The WRA-YD-8W&WRB-YD-8W series is a family of high performance 8W DC/DC converter modules featuring wide 2:1 input voltage ranges in a DIP-24 package with industry standard footprint. A very high efficiency allows an operating temperature range of  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . A built-in EMI input filter complies with EN 55022, class A with external components. Further standard features include remote On/Off and short-circuit protection.

Typical applications for these converters are battery operated equipment, instrumentation, communication and industrial electronics, everywhere where isolated, tightly regulated voltages are required and space is limited on the PCB.



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## SELECTION GUIDE

| Order code   | Input voltage range | Output voltage | Output current max. | Efficiency typ. |
|--------------|---------------------|----------------|---------------------|-----------------|
| WRB1203YD-8W | 9 – 18VDC           | 3.3VDC         | 2000mA              | 80%             |
| WRB1205YD-8W | 9 – 18VDC           | 5VDC           | 1500mA              | 83%             |
| WRB1212YD-8W | 9 – 18VDC           | 12VDC          | 665mA               | 88%             |
| WRB1215YD-8W | 9 – 18VDC           | 15VDC          | 535mA               | 87%             |
| WRA1205YD-8W | 9 – 18VDC           | ± 5VDC         | ±800mA              | 83%             |
| WRA1212YD-8W | 9 – 18VDC           | ±12VDC         | ±335mA              | 87%             |
| WRA1215YD-8W | 9 – 18VDC           | ±15VDC         | ±265mA              | 85%             |
| WRB2403YD-8W | 18 – 36VDC          | 3.3VDC         | 2000mA              | 80%             |
| WRB2405YD-8W | 18 – 36VDC          | 5VDC           | 1500mA              | 83%             |
| WRB2412YD-8W | 18 – 36VDC          | 12VDC          | 665mA               | 86%             |
| WRB2415YD-8W | 18 – 36VDC          | 15VDC          | 535mA               | 85%             |
| WRA2405YD-8W | 18 – 36VDC          | ± 5VDC         | ±800mA              | 82%             |
| WRA2412YD-8W | 18 – 36VDC          | ±12VDC         | ±335mA              | 86%             |
| WRA2415YD-8W | 18 – 36VDC          | ±15VDC         | ±265mA              | 85%             |
| WRB4803YD-8W | 36 – 75VDC          | 3.3VDC         | 2000mA              | 80%             |
| WRB4805YD-8W | 36 – 75VDC          | 5VDC           | 1500mA              | 83%             |
| WRB4812YD-8W | 36 – 75VDC          | 12VDC          | 665mA               | 86%             |
| WRB4815YD-8W | 36 – 75VDC          | 15VDC          | 535mA               | 86%             |
| WRA4805YD-8W | 36 – 75VDC          | ± 5VDC         | ±800mA              | 85%             |
| WRA4812YD-8W | 36 – 75VDC          | ±12VDC         | ±335mA              | 87%             |
| WRA4815YD-8W | 36 – 75VDC          | ±15VDC         | ±265mA              | 87%             |

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

### Input Specifications

|                                |         |                      |                                        |
|--------------------------------|---------|----------------------|----------------------------------------|
| Input current (no load)        |         | 12 Vin models:       | 20 mA typ.                             |
|                                |         | 24 Vin models:       | 15 mA typ.                             |
|                                |         | 48 Vin models:       | 10 mA typ.                             |
| Input current (full load)      | 12 Vin; | 3.3 Vout models:     | 700 mA typ.                            |
|                                | 12 Vin; | other output models: | 820 mA typ.                            |
|                                | 24 Vin; | 3.3 Vout models:     | 350 mA typ.                            |
|                                | 24 Vin; | other output models: | 400 mA typ.                            |
|                                | 48 Vin; | 3.3 Vout models:     | 170 mA typ.                            |
|                                | 48 Vin; | other output models: | 200 mA typ.                            |
| Surge voltage (100 msec. max.) |         | 12 Vin models:       | 36 V max.                              |
|                                |         | 24 Vin models:       | 50 V max.                              |
|                                |         | 48 Vin models:       | 100 V max.                             |
| Conducted noise (input)        |         |                      | EN 55022 level A, FCC part 15, level A |
| ESD (input)                    |         |                      | EN 61000-4-2, Perf. Criteria B         |
| Fast Transient (input)         |         |                      | EN 61000-4-4, Perf. Criteria B         |
| Surge (input)                  |         |                      | EN 61000-4-5, Perf. Criteria B         |

### Output Specifications

|                                            |                                       |                                   |                                                                                                                                                     |
|--------------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage set accuracy                       |                                       |                                   | ± 2%                                                                                                                                                |
| Regulation                                 | – Input variation Vin min. to Vin max |                                   | 0.2 % max.                                                                                                                                          |
|                                            | – Load variation 25 – 100%            |                                   |                                                                                                                                                     |
|                                            |                                       | single output models:             | 1 % max.                                                                                                                                            |
|                                            |                                       | dual output models:               | 1 % max.                                                                                                                                            |
|                                            | – Load cross variation 25 % / 100 %   |                                   | 5 % max.                                                                                                                                            |
| Temperature coefficient                    |                                       |                                   | 0.02 % /K                                                                                                                                           |
| Ripple and noise (20 MHz Bandwidth)        |                                       |                                   | 50 mVpk-pk max.                                                                                                                                     |
| Start up time (nominal Vin and constant)   |                                       |                                   | 600 ms typ.                                                                                                                                         |
| Transient response(25% load step change)   |                                       |                                   | 200 µs typ.                                                                                                                                         |
| Short circuit protection                   |                                       |                                   | indefinite (automatic recovery)                                                                                                                     |
| Over load protection                       |                                       |                                   | 150% of Iout max typ. foldback                                                                                                                      |
| Minimum load (only for dual output models) |                                       |                                   | 10% of rated max current (operation at lower load condition will not damage these converters, however, they may not meet all listed specifications) |
| Capacitive load                            |                                       | 3.3 Vout models:                  | 8000 µF max.                                                                                                                                        |
|                                            |                                       | 5 Vout models / ± 5 Vout models:  | 1600 µF max. / ± 1000 µF max.                                                                                                                       |
|                                            |                                       | 12 Vout models / ±12 Vout models: | 350 µF max. / ± 160 µF max.                                                                                                                         |
|                                            |                                       | 15 Vout models / ±15 Vout models: | 240 µF max. / ± 100 µF max.                                                                                                                         |

### General Specifications

|                           |                    |  |                    |
|---------------------------|--------------------|--|--------------------|
| Temperature ranges        | – Operating        |  | –40 °C to +85 °C   |
|                           | – Case temperature |  | +100 °C max.       |
|                           | – Storage          |  | –55 °C to +105 °C  |
| Derating                  |                    |  | 3.3% /K above 70°C |
| Humidity (non condensing) |                    |  | 95 % rel H max.    |

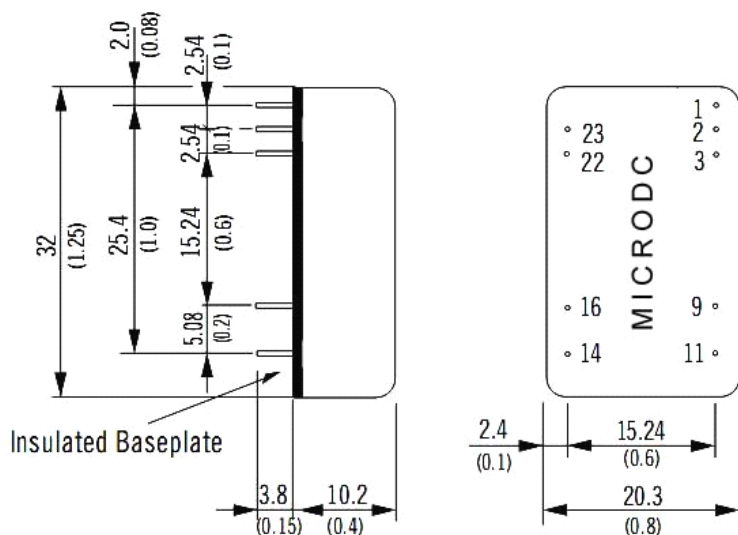
### General Specifications

|                                                            |                |                   |                                                                                      |
|------------------------------------------------------------|----------------|-------------------|--------------------------------------------------------------------------------------|
| Reliability, calculated MTBF (MIL-HDBK-217F ground benign) |                |                   | >715000 h @ +25 °C                                                                   |
| Isolation voltage (60sec.)                                 | – Input/Output |                   | 1500 VDC                                                                             |
| Isolation capacity                                         | – Input/Output |                   | 300 pF max.                                                                          |
| Isolation Resistance                                       | – Input/Output |                   | > 1000 M Ohm                                                                         |
| Switching frequency                                        |                |                   | 300 kHz typ. (pulse width modulation PWM)                                            |
| Vibration                                                  |                |                   | 10-55Hz, 2G, 30 minutes along X,Y,Z                                                  |
| Safety standards                                           |                |                   | UL/cUL 60950-1, IEC/EN 60950-1 compliance<br>up to 60 VDC input voltage (SELV limit) |
| Safety approvals                                           | – UL/cUL       |                   | certifications - File E188913                                                        |
| Remote On/Off                                              |                | On:               | 3.5 ... 12 VDC or open circuit                                                       |
|                                                            |                | Off:              | 0 ... 1.2 VDC or short circuit pin 1 and pin 2/3                                     |
|                                                            |                | Off idle current: | 2.5 mA                                                                               |

### Physical Specifications

|                       |                        |
|-----------------------|------------------------|
| Case material         | copper , nickel plated |
| Baseplate material    | non conductive FR4     |
| Potting material      | epoxy (UL94V-0 rated)  |
| Weight                | 17 g (0.60 oz)         |
| Soldering temperature | max. 265 °C / 10 sec.  |

### Outline Dimensions



Dimensions in [mm], ( ) = Inch

Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02  $\pm 0.002$ )

Tolerances  $\pm 0.5$  (0.02)

Pin pitch tolerances  $\pm 0.35$  (0.014)

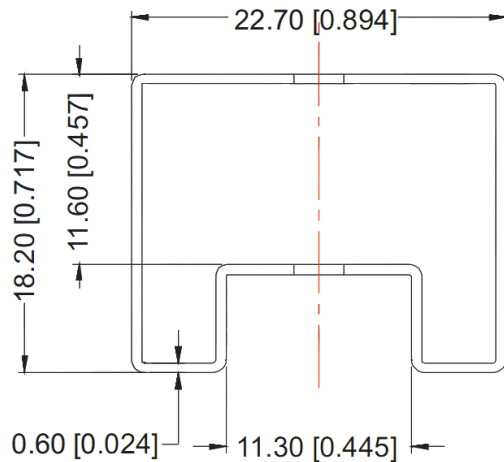
Specifications can be changed any time without notice

### FOOTPRINT DETAILS

| Pin | Single        | Dual          |
|-----|---------------|---------------|
| 1   | Remote On/Off | Remote On/Off |
| 2   | –Vin (GND)    | –Vin (GND)    |
| 3   | –Vin (GND)    | –Vin (GND)    |
| 9   | No con.       | Common        |
| 11  | No con.       | –Vout         |
| 14  | +Vout         | +Vout         |
| 16  | –Vout         | Common        |
| 22  | +Vin (Vcc)    | +Vin (Vcc)    |
| 23  | +Vin (Vcc)    | +Vin (Vcc)    |

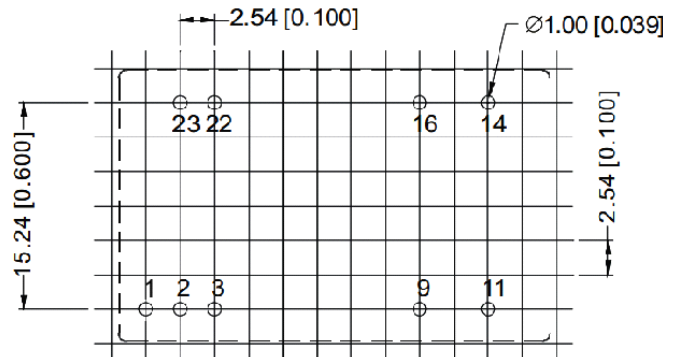
NC: NO Connection

### 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

### RECOMMENDED FOOTPRINT



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

#### 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 datasheet, 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.

**MICRODC**  
 Professional Power Module

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#### RoHS COMPLIANT INFORMATION

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300 ° C for 10 seconds.  
 The pin termination finish on the SIP package type is Tin Plate, Hot Dipped over Matte Tin with Nickel Preplate. The DIP types are Matte Tin over Nickel Preplate. Both types in this series are backward compatible with Sn/Pb soldering systems.



#### REACH COMPLIANT INFORMATION

This series has proven that this product does not contain harmful chemicals, it also has harmful chemical substances through the registration, inspection and approval.