

## FEATURES

- ◆ Wide (4:1) Input Range
- ◆ Short Circuit Protection(automatic recovery)
- ◆ 1500VDC Isolation
- ◆ Operating Temperature: -40°C ~ + 85°C
- ◆ Excellent load and line regulation
- ◆ Ultra-compact SIP-8 packaged
- ◆ Internal SMD construction
- ◆ Remote On/Off control
- ◆ Small footprint:22\*9.5mm
- ◆ Excellent load and line regulation

## MODEL SELECTION

**WRB<sup>①</sup>24<sup>②</sup>12<sup>③</sup>Z<sup>④</sup>S<sup>⑤</sup>-6W<sup>⑥</sup>**

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

## APPLICATIONS

The WRA\_ZS-6W&WRB\_ZS-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≤4:1);
- 2) Where isolation is necessary between input and output (Isolation voltage≤1500VDC);
- 3) Where the regulation of the Output voltage and the output ripple noise are demanded.



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## SELECTION GUIDE

| Order code   | Input        |       | Output           |                     | Efficiency<br>(%.Typ.) |
|--------------|--------------|-------|------------------|---------------------|------------------------|
|              | Voltage(VDC) |       | Voltage<br>(VDC) | Current(mA)<br>Max. |                        |
|              | Nominal      | Range |                  |                     |                        |
| WRB2403ZS-6W | 24           | 9-36  | 3.3              | 1350                | 81                     |
| WRB2405ZS-6W | 24           | 9-36  | 5                | 1200                | 83                     |
| WRB2412ZS-6W | 24           | 9-36  | 12               | 500                 | 74                     |
| WRB2415ZS-6W | 24           | 9-36  | 15               | 400                 | 76                     |
| WRA2405ZS-6W | 24           | 9-36  | ±5               | ±600                | 81                     |
| WRA2412ZS-6W | 24           | 9-36  | ±12              | ±250                | 81                     |
| WRA2415ZS-6W | 24           | 9-36  | ±15              | ±200                | 85                     |
| WRB4803ZS-6W | 48           | 18-75 | 3.3              | 1350                | 83                     |
| WRB4805ZS-6W | 48           | 18-75 | 5                | 1200                | 85                     |
| WRB4812ZS-6W | 48           | 18-75 | 12               | 500                 | 74                     |
| WRB4815ZS-6W | 48           | 18-75 | 15               | 400                 | 78                     |
| WRA4805ZS-6W | 48           | 18-75 | ±5               | ±600                | 80                     |
| WRA4812ZS-6W | 48           | 18-75 | ±12              | ±250                | 80                     |
| WRA4815ZS-6W | 48           | 18-75 | ±15              | ±200                | 85                     |

NOTE:  
 Case material:non-conductive plastic  
 Weight: 4.8g (0.17oz)

## Input Specifications

| Parameter                         | Conditions                                                     | Max.      |
|-----------------------------------|----------------------------------------------------------------|-----------|
| Input current at full load        | 24Vin models:                                                  | 170mAmax. |
|                                   | 48 Vin models:                                                 | 85mAmax.  |
| Surge voltage<br>(100 msec. max.) | 24 Vin models:                                                 | 50Vmax.   |
|                                   | 48 Vin models:                                                 | 100Vmax.  |
| Input current at no load          | 24 Vin models:                                                 | 25mA typ. |
|                                   | 48 Vin models:                                                 | 15mA typ. |
| Input filter                      | EN 55022 level A, FCC part 15, level A with external capacitor |           |

The WR-ZS-6W series is a new family of isolated 3W DC/DC converters with regulated output, featuring ultra-wide 4:1 input voltage range. The product comes in a ultra-compact SIP plastic package with a small footprint occupying only 2.0 cm<sup>2</sup> (0.3 square in.) of board space. An excellent efficiency allows -40° to +85°C operation temperatures.

Further features include remote On/Off control and continuous short circuit protection. The very compact dimensions of these converters make them an ideal solution for many space critical applications in battery-powered equipment and instrumentation.

Order code Input voltage Output voltage Output current max. Effie

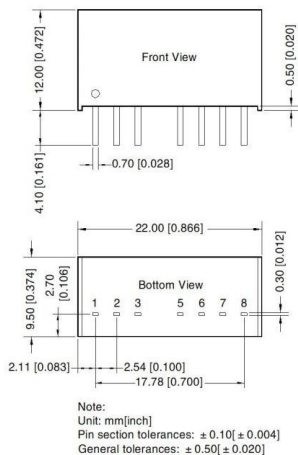
| Output Specifications                                     |                                                 |                                 |
|-----------------------------------------------------------|-------------------------------------------------|---------------------------------|
| Parameter                                                 | Conditions                                      |                                 |
| Voltage set accuracy                                      | ± 1 % max                                       |                                 |
| Regulation                                                | - Input variation Vin min. to Vin max.          | 0.2 % max.                      |
|                                                           | - Load variation 5 – 100% single output models: | 1.0% max.                       |
|                                                           | dual output models:                             | 1.0 % max. balanced load        |
|                                                           | - Load cross regulation 25/100%                 | 5.0 % max. (dual output models) |
| Minimum load                                              | not required                                    |                                 |
| Temperature coefficient                                   | 0.1 %/K                                         |                                 |
| Ripple and noise (20 MHz Bandwidth)                       | 30 mVpk-pk max.                                 |                                 |
| Start up time<br>(constant resistive load)                | - Power On                                      | 30 ms typ.                      |
|                                                           | - Remote On                                     | 30 ms typ.                      |
| Transient response setting time<br>(25% load step change) | 500 µs typ                                      |                                 |
| Temperature coefficient                                   | ± 0.1 %/°C                                      |                                 |
| Short circuit protection                                  | continuous, automatic recovery                  |                                 |
| Capacitive load                                           | 3.3 VDC output models:                          | 1'760 µF max.                   |
|                                                           | 5 VDC output models:                            | 1'000 µF max.                   |
|                                                           | 12 VDC output models:                           | 170 µF max.                     |
|                                                           | 15 VDC output models:                           | 110 µF max.                     |
|                                                           | ±5 VDC output models:                           | ± 470 µF max.                   |
|                                                           | ±12 VDC output models:                          | ± 100 µF max.                   |
|                                                           | ±15 VDC output models:                          | ± 47 µF max.                    |

| General Specifications                                        |                                          |                                             |
|---------------------------------------------------------------|------------------------------------------|---------------------------------------------|
| Parameter                                                     | Conditions                               |                                             |
| Temperature ranges                                            | - Operating                              | - 40 °C~ + 85 °C (no derating)              |
|                                                               | - Case temperature                       | +100 °C max.                                |
|                                                               | - Storage                                | - 55 °C ~ + 125 °C                          |
| Load derating                                                 | 3.5 %/K above 70°C                       |                                             |
| Humidity (non condensing)                                     | 95 % rel. H max.                         |                                             |
| Reliability, calculated MTBF<br>(MIL-HDBK-217F ground benign) | >1.7Mio h @ 25°C                         |                                             |
| Isolation voltage (60 sec)                                    | - Input/Output                           | 1'500 VDC                                   |
| Isolation capacity                                            | - Input/Output                           | 200 pF max.                                 |
| Isolation resistance                                          | - Input/Output (500 VDC)                 | >1 GOhm                                     |
| Switching frequency                                           | 100 kHz (PWM)                            |                                             |
| Remote On/Off                                                 | - On:                                    | open or high impedance                      |
|                                                               | - Off:                                   | 2...4 mA current applied via 1KOhm resistor |
|                                                               | - Off stand by input current             | 2.5 mA max.                                 |
| Vibration and thermal shock                                   | MIL-STD-810E                             |                                             |
| Safety standards                                              | UL /cUL 60950-1, EN 60950-1, IEC 60950-1 |                                             |
| Safety approvals                                              | - UL/cUL                                 | pending                                     |

All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

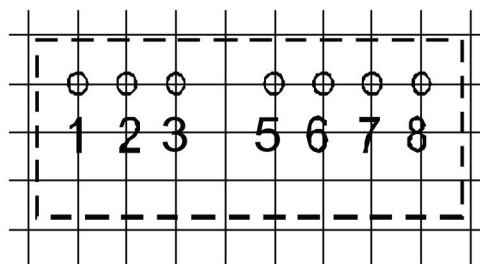
### OUTLINE DIMENSIONS & FOOTPRINT DETAILS

#### MECHANICAL DIMENSIONS



#### RECOMMENDED FOOTPRINT

### Dual/Single Output



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

#### FOOTPRINT DETAILS

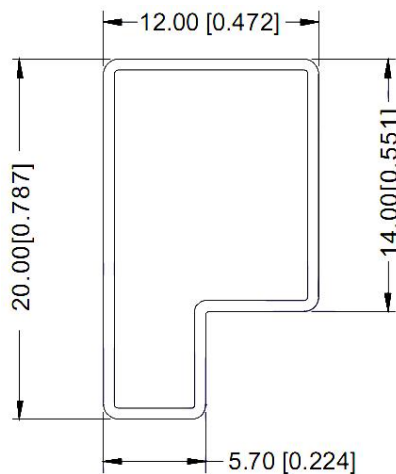
| Pin | Single        | Dual          |
|-----|---------------|---------------|
| 1   | -Vin(GND)     | -Vin(GND)     |
| 2   | +Vin(Vcc)     | +Vin(Vcc)     |
| 3   | Remote On/Off | Remote On/Off |
| 5   | No function   | No function   |
| 6   | +Vout         | +Vout         |
| 7   | -Vout         | Common        |
| 8   | No function   | -Vout         |

Note: specifications can be changed any time without notice.

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.

#### TUBE OUTLINE DIMENSIONS



Note:  
 Unit: mm[inch]  
 General tolerances:  $\pm 0.50\text{mm}[\pm 0.020\text{inch}]$   
 L=530mm[20.866inch] Tube Quantity: 22pcs  
 L=220mm[8.661inch] Tube Quantity: 8pcs

#### 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.