

# WRAP-3W Series



*WIDE INPUT ISOLATED & REGULATED  
3W OUTPUT  
DUAL OUTPUT  
MINIATURE DIP PACKAGE*

## FEATURES

- Wide (2:1) Input Range
- Efficiency to 82%
- Operating Temperature: -40°C~+85°C
- 1KVDC Isolation
- Dual Output
- UL94-V0 Package
- No Heat sink Required
- Industry Standard Pin out
- MTBF>1,000,000 hours
- Custom Service Available

## APPLICATIONS

The WRAP-3W 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:

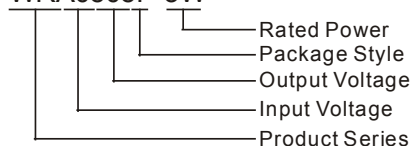
- 1) Where the voltage of the input power supply is wide range (voltage range: 2:1);
- 2) Where isolation is necessary between input and output (isolation voltage =1000VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanding.

These products don't apply to:

- 1) Where the input voltage is required to be more than 2:1;
- 2) Where the isolation voltage between input and output is required to be >1000VDC;
- 3) The output load's actual power consumption is less than 1W, otherwise our company's WRAP-1W/0.5W series are recommended.

## MODEL SELECTION

WRA0505P-3W



## PRODUCT PROGRAM

| Part Number | Input Voltage (VDC) |          |      | Output        |              |     | Efficiency (% , Typ) | Package Style |
|-------------|---------------------|----------|------|---------------|--------------|-----|----------------------|---------------|
|             | Nominal             | Range    | Max* | Voltage (VDC) | Current (mA) |     |                      |               |
|             |                     |          |      |               | Max          | Min |                      |               |
| WRA0505P-3W | 5                   | 4.5~9VDC | 11   | ±5            | 300          | 30  | 65                   | DIP           |
| WRA0509P-3W | 5                   | 4.5~9VDC | 11   | ±9            | 165          | 16  | 67                   | DIP           |
| WRA0512P-3W | 5                   | 4.5~9VDC | 11   | ±12           | 125          | 12  | 70                   | DIP           |
| WRA0515P-3W | 5                   | 4.5~9VDC | 11   | ±15           | 100          | 10  | 72                   | DIP           |
| WRA1205P-3W | 12                  | 9~18VDC  | 22   | ±5            | 300          | 30  | 72                   | DIP           |
| WRA1209P-3W | 12                  | 9~18VDC  | 22   | ±9            | 165          | 16  | 73                   | DIP           |
| WRA1212P-3W | 12                  | 9~18VDC  | 22   | ±12           | 125          | 12  | 77                   | DIP           |
| WRA1215P-3W | 12                  | 9~18VDC  | 22   | ±15           | 100          | 10  | 79                   | DIP           |
| WRA1505P-3W | 15                  | 12~24VDC | 30   | ±5            | 300          | 30  | 75                   | DIP           |
| WRA1509P-3W | 15                  | 12~24VDC | 30   | ±9            | 165          | 16  | 79                   | DIP           |
| WRA1512P-3W | 15                  | 12~24VDC | 30   | ±12           | 125          | 12  | 80                   | DIP           |
| WRA1515P-3W | 15                  | 12~24VDC | 30   | ±15           | 100          | 10  | 81                   | DIP           |
| WRA2405P-3W | 24                  | 18~36VDC | 40   | ±5            | 300          | 30  | 78                   | DIP           |
| WRA2409P-3W | 24                  | 18~36VDC | 40   | ±9            | 165          | 16  | 80                   | DIP           |
| WRA2412P-3W | 24                  | 18~36VDC | 40   | ±12           | 125          | 12  | 81                   | DIP           |
| WRA2415P-3W | 24                  | 18~36VDC | 40   | ±15           | 100          | 10  | 82                   | DIP           |
| WRA4805P-3W | 48                  | 36~72VDC | 80   | ±5            | 300          | 30  | 76                   | DIP           |
| WRA4809P-3W | 48                  | 36~72VDC | 80   | ±9            | 165          | 16  | 81                   | DIP           |
| WRA4812P-3W | 48                  | 36~72VDC | 80   | ±12           | 125          | 12  | 81                   | DIP           |
| WRA4815P-3W | 48                  | 36~72VDC | 80   | ±15           | 100          | 10  | 82                   | DIP           |

## ISOLATION SPECIFICATIONS

| Item                 | Test conditions             | Min  | Typ | Max | Units |
|----------------------|-----------------------------|------|-----|-----|-------|
| Isolation voltage    | Flash tested for 60 seconds | 1000 |     |     | VDC   |
| Isolation resistance | Test at 500VDC              | 1000 |     |     | MΩ    |

## OUTPUT SPECIFICATIONS

| Item                      | Test conditions                   | Min | Typ  | Max  | Units  |
|---------------------------|-----------------------------------|-----|------|------|--------|
| 3W output power           | See below products program        | 0.3 |      | 3    | 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             |     | ±0.1 | ±0.2 |        |
| Line regulation           | Input Voltage From Low to High    |     | ±0.2 | ±0.5 | % / °C |
| Temperature drift (Vout)  | Refer to recommended circuit      |     |      | 0.03 |        |
| Ripple                    | 20Hz-300KHz bandwidth             |     | 30   | 60   | mVp-p  |
| Noise                     | DC-20MHz bandwidth                |     | 80   | 150  |        |
| Switching frequency       | 100% load , nominal input voltage | 80  |      | 200  | KHz    |
|                           | 10% load , nominal input voltage  | 250 |      | 600  |        |

Note:

- 1.All specifications measured at T<sub>a</sub>=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- 2.See below recommended circuits for more details.



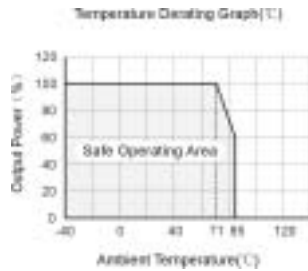
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## COMMON SPECIFICATION

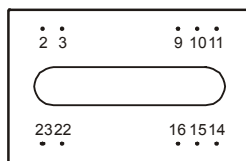
|   |  |
|---|--|
| Output Short Circuit Protection                     | Continuous                             |
| Temperature Rise at Full Load                       | 30°C (TYP)                             |
| Cooling   | Free Air Convection                    |
| No-load Power Consumption                           | 100mW (typical)                        |
| Operating Temperature Range                         | -40°C~+85°C                            |
| Storage Temperature Range                           | -55°C ~+125°C                          |
| Lead Temperature***                                 | 300°C (1.5mm from case for 10 seconds) |
| Storage Humidity Range                              | ≤ 95%                                  |
| Case Material                                       | Plastic (UL94-V0)                      |
| MTBF  | >1,000,000 hours                       |
| ***Lead Temperature 1.5mm from case for 10 seconds. |  |

## TYPICAL CHARECTERISTICS



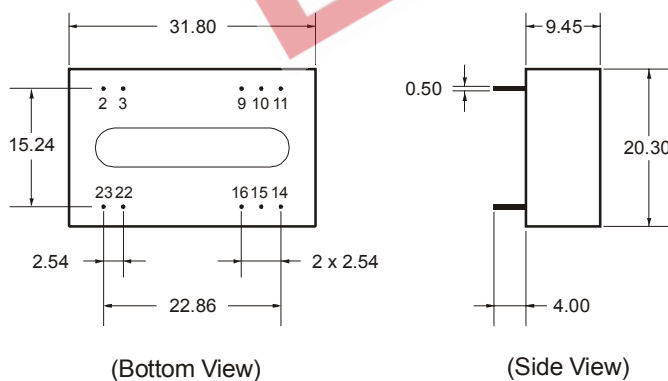
## FOOTPRINT DETAILS

Bottom View



| Pin   | WRAP Series |
|-------|-------------|
| 2,3   | GND         |
| 10,15 | NC          |
| 14    | +Vo         |
| 11    | -Vo         |
| 9,16  | 0V          |
| 22,23 | Vin         |

## OUTLINE DIMENSIONS & RECOMMENDED FOOTPRINT



Note: All Pins on a 2.54mm pitch; All Pin diameters are 0.50 mm(Tolerance: ± 0.25); All dimensions in mm. The dimensions of the WRAP series are correspondent with the WRBP series.

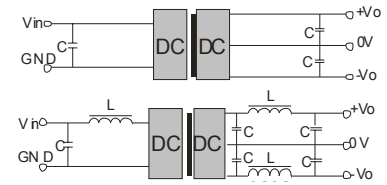
## APPLICATION NOTE

### Recommended Circuit

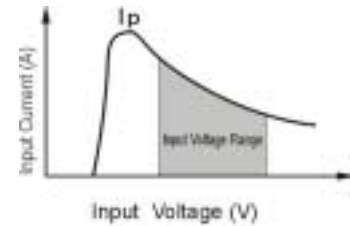
All the WRA-3W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load. Never be tested under no load (See Figure 1 & 2). If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high.(See table 1).If you want to use the products in high EMI, please choose our metal packaged products.

### Input Current

When it is used in unregulated power supply , be sure that the fluctuating range of the power



( Figure 1)



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. (See figure 2)

### External Capacitor

Although this series of DC/DC converter can work without external capacitor, in order to keep an optimum performance, however, it needs external capacitor. (See Table 1)

### Requirement on Output Load

To ensure this module operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum output load is not less than **10%** Of the full load, and that this product **should never be operated under no load!!!** If the actual load is less below the specified minimum load , the output ripple of this type of DC/DC converter will increase drastically and at the same time efficiency & reliability of the circuit will decrease deeply .If the actual output power from the load in your circuit is very small , please connect a resistor with proper resistance at the output end to in parallel to increase the load, or use our company's other products with a lower rated output power.

**The products cannot be used in parallel and in plug and play.**

### External Capacitor Table(Table 1)

| Vin             | C <sub>in</sub> | C <sub>out</sub><br>(0+70°C)         | C <sub>out</sub><br>(-40+85°C)  |
|-----------------|-----------------|--------------------------------------|---------------------------------|
| 5V<br>&<br>12V  | 100uF           | 100uF<br>(electrolytic<br>capacitor) | 47uF<br>(tantalum<br>capacitor) |
| 24V<br>&<br>48V | 10uF            |                                      |                                 |



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