

MORNSUN

WRA_ZP-3W & WRB_ZP-3W Series 3W, WIDE INPUT, ISOLATED & REGULATED DUAL/SINGLE OUTPUT, DC-DC CONVERTER



RoHS

FEATURES

- 2:1 wide input voltage range
- Operating temperature: -40°C ~ +85°C
- Short circuit protection (automatic recovery)
- 1500VDC isolation
- Internal SMD construction
- Metal shielding package
- No heat sink required
- Industry standard pinout
- MTBF > 1,000,000 hours
- RoHS Compliance

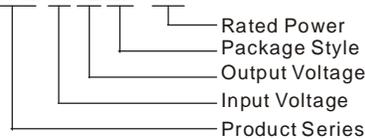
APPLICATIONS

The WRA_ZP-3W & WRB_ZP-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 ranges $\leq 2:1$);
- 2) Where isolation is necessary between input and output (isolation voltage $\leq 1500VDC$);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

MODEL SELECTION

WRB0512ZP-3W



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PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (% , Typ.)
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max*		Max.	Min.	
WRA0505ZP-3W	5	4.5-9	11	±5	±300	±30	68
WRA0512ZP-3W				±12	±125	±12	71
WRA0515ZP-3W				±15	±100	±10	71
WRB0505ZP-3W				5	600	60	68
WRB0512ZP-3W				12	250	25	71
WRB0515ZP-3W				15	200	20	71
WRA1205ZP-3W	12	9-18	22	±5	±300	±30	76
WRA1212ZP-3W				±12	±125	±12	79
WRA1215ZP-3W				±15	±100	±10	80
WRB1203ZP-3W				3.3	909	90	71
WRB1205ZP-3W				5	600	60	76
WRB1212ZP-3W				12	250	25	79
WRB1215ZP-3W	15	200	20	80			
WRA2405ZP-3W	24	18-36	40	±5	±300	±30	78
WRA2412ZP-3W				±12	±125	±12	80
WRA2415ZP-3W				±15	±100	±10	81
WRB2403ZP-3W				3.3	909	90	76
WRB2405ZP-3W				5	600	60	78
WRB2412ZP-3W				12	250	25	81
WRB2415ZP-3W	15	200	20	82			
WRA4805ZP-3W	48	36-72	80	±5	±300	±30	78
WRA4812ZP-3W				±12	±125	±12	80
WRA4815ZP-3W				±15	±100	±10	81
WRB4803ZP-3W				3.3	909	90	76
WRB4805ZP-3W				5	600	60	78
WRB4812ZP-3W				12	250	25	80
WRB4815ZP-3W	15	200	20	81			

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

COMMON SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Temp. rise at full load			15		
Lead temperature	1.5mm from case for 10 seconds			300	
No-load power consumption			0.2		W
Cooling		Free air convection			
Short circuit protection		Continuous, automatic recovery			
Case material		Copper, nickel coated			
MTBF		1000			K hours
Weight			15		g

ISOLATION SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1 mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output		85		pF

OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
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	10% to 100% load(WRB_ZP_3W)		±0.5	±0.75	%
	10% to 100% load(WRA_ZP_3W)*		±0.5	±1	
Line regulation	Input voltage from low to high		±0.2	±0.5	
Temperature drift	Refer to recommended circuit			±0.03	%/°C
Ripple & Noise**	20MHz Bandwidth		50	100	mVp-p
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.

APPLICATION NOTE

1) 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.

2) Recommended Circuit

All the WRA_ZP-3W & WRB_ZP-3W Series have been tested according to the following recommended testing circuit before leaving factory (Figure 1). This series should be tested under load.

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 10μF~47μF

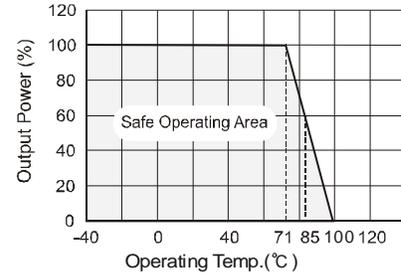
Cout: 10μF/100mA

3) Input Current

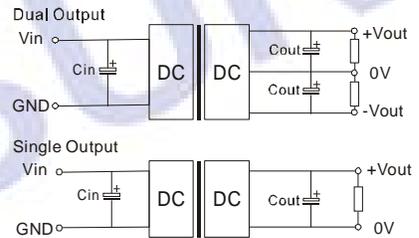
When it is used in unregulated power supply, be sure that the fluctuating range of the power supply and the rippled voltage do not exceed the module standard. Input current of power supply should afford the startup current of this kind of DC/DC module (See figure 2), General: $I_p \leq 1.4 * I_{in-max}$

4) No parallel connection or plug and play

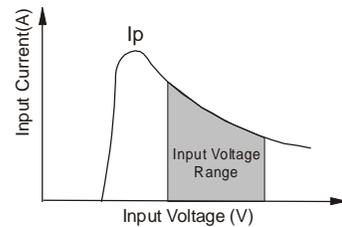
TYPICAL CHARACTERISTICS



RECOMMENDED CIRCUIT



(Figure 1)



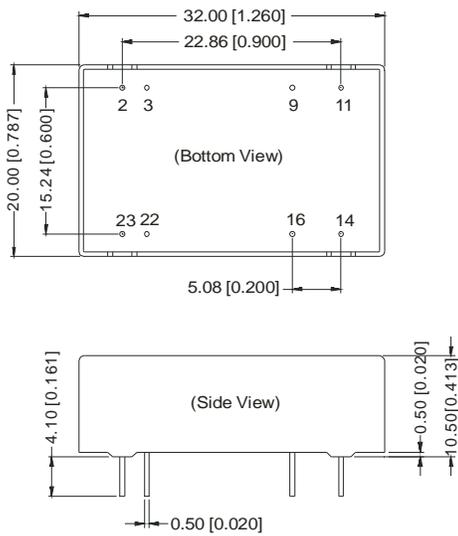
(Figure 2)

Output External Capacitor Table (Table 1)

Single Vout (VDC)	Cout (uF)	Dual Vout (VDC)	Cout (uF)
3.3	2200	±5	680
5	1000	±9	470
12	470	±12	330
15	330	±15	220

OUTLINE DIMENSIONS & PIN CONNECTIONS

MECHANICAL DIMENSIONS

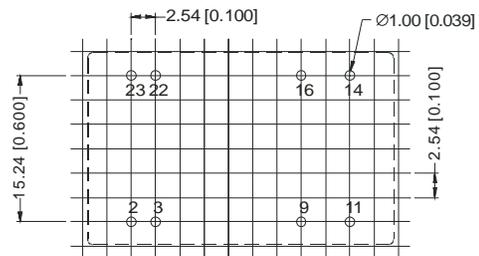


Note:
 Unit:mm[inch]
 Pin diameter tolerances: $\pm 0.10\text{mm}[\pm 0.004\text{inch}]$
 General tolerances: $\pm 0.25\text{mm}[\pm 0.010\text{inch}]$

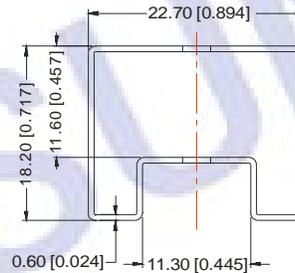
FOOTPRINT DETAILS		
Pin	Single	Dual
2,3	GND	GND
9	No Pin	0V
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V
22,23	Vin	Vin

NC: No connection

RECOMMENDED FOOTPRINT



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: 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 $T_a=25^\circ\text{C}$, 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.