

## WRB\_SP-2W Series

WIDE INPUT ISOLATED & REGULATED  
2W OUTPUT SINGLE OUTPUT  
DIP PACKAGE



RoHS

multi-country patent protection

### FEATURES

- Wide (2:1) Input Range
- Efficiency Up To 85%
- Operating Temperature: -40°C~+85°C
- 1.5KVDC Isolation
- Single Output
- Metal Shielding Package
- No Heat Sink Required
- Industry Standard Pin out
- MTBF>1,000,000 hours
- RoHS Compliance

### APPLICATIONS

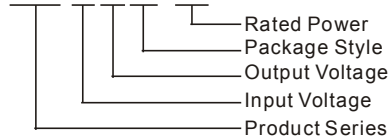
The WRB\_SP-2W Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

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 =1500VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

### MODEL SELECTION

WRB0512SP-2W



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### PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (% Typ)	Package Style
	Voltage (VDC)			Voltage (VDC)	Current (mA)			
	Nominal	Range	Max*		Max	Min		
WRB0505SP-2W	5	4.5~9VDC	11	5	400	40	67	DIP
WRB0509SP-2W	5	4.5~9VDC	11	9	220	22	68	DIP
WRB0512SP-2W	5	4.5~9VDC	11	12	165	16	71	DIP
WRB0515SP-2W	5	4.5~9VDC	11	15	65	6	74	DIP
WRB1205SP-2W	12	9~18VDC	22	5	400	40	74	DIP
WRB1209SP-2W	12	9~18VDC	22	9	220	22	75	DIP
WRB1212SP-2W	12	9~18VDC	22	12	165	16	77	DIP
WRB1215SP-2W	12	9~18VDC	22	15	65	6	80	DIP
WRB1505SP-2W	15	12~24VDC	30	5	400	40	75	DIP
WRB1509SP-2W	15	12~24VDC	30	9	220	22	79	DIP
WRB1512SP-2W	15	12~24VDC	30	12	165	16	79	DIP
WRB1515SP-2W	15	12~24VDC	30	15	65	6	81	DIP
WRB2405SP-2W	24	18~36VDC	40	5	400	40	77	DIP
WRB2409SP-2W	24	18~36VDC	40	9	220	22	80	DIP
WRB2412SP-2W	24	18~36VDC	40	12	165	16	82	DIP
WRB2415SP-2W	24	18~36VDC	40	15	65	6	83	DIP
WRB4805SP-2W	48	36~72VDC	80	5	400	40	77	DIP
WRB4809SP-2W	48	36~72VDC	80	9	220	22	82	DIP
WRB4812SP-2W	48	36~72VDC	80	12	165	16	84	DIP
WRB4815SP-2W	48	36~72VDC	80	15	65	6	84	DIP

### ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Flash tested for 60 seconds	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ

### OUTPUT SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
2W Output Power	See Below Products Program	0.2		2	W
Output Voltage Accuracy	Refer To Recommended Circuit		±1	±3	%
Load Regulation	From 10% To 100% Load		±0.5	±0.75	
Line Regulation	Input Voltage From Low To High		±0.2	±0.5	
Temperature Drift(Vout)	Refer To Recommended Circuit			0.03	%/°C
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:

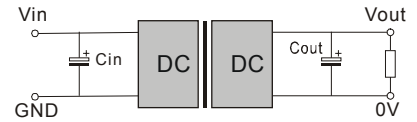
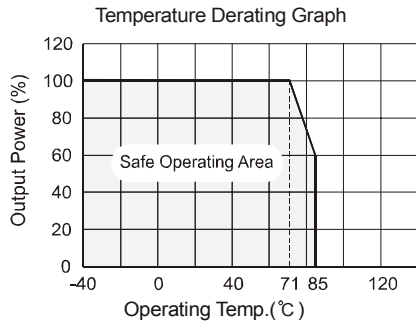
- 1.All specifications measured at T<sub>A</sub>=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- 2.See below recommended circuits for more details.

## COMMON SPECIFICATION

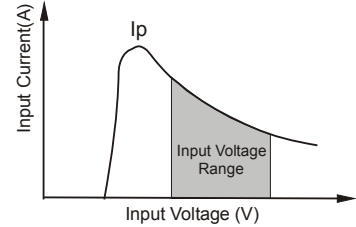
Output Short Circuit Protection	Continuous
Temperature Rise at Full Load	30°C (TYP)
Cooling	Free Air Convection
No-load Power Consumption	100mW (typical)
Operating Temperature Range	-40°C~+85°C
Storage Temperature Range	-55°C ~+125°C
Lead Temperature***	300°C (1.5mm from case for 10 seconds)
Storage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

\*\*\*Lead Temperature 1.5mm from case for 10 seconds.

## TYPICAL CHARECTERISTICS



(Figure 1)



(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

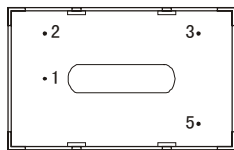
To ensure this module operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum out put load is not less than **10%** Of 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(See Table 1)

Vin	Cin	Cout (0+70°C)	Cout (-40+85°C)
5V & 12V	100uF	100uF (electrolytic capacitor)	47uF (tantalum capacitor)
24V & 48V	10uF		

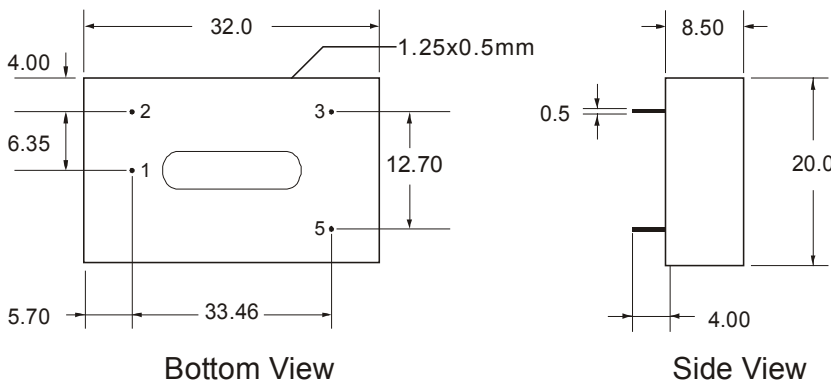
## FOOTPRINT DETAILS



Bottom View

Pin	Function
1	Vin
2	GND
3	0V
5	+Vo

## OUTLINE DIMENSIONS & RECOMMENDED FOOTPRINT



Bottom View

Side View

Note: All Pins on a 2.54mm pitch; All Pin diameters are 0.50 mm(Tolerance:±0.25);

## APPLICATION NOTE

### Recommended Circuit

All the WRB\_SP-2W 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 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)



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