



## WRF\_P-3W Series

WIDE INPUT ISOLATED & REGULATED  
3W OUTPUT SINGLE OUTPUT  
DIP PACKAGE

RoHS

multi-country patent protection

### FEATURES

- Wide (2:1) Input Range
- Efficiency Up To 83%
- Operating Temperature: -40°C~+85°C
- 3KVDC Isolation
- Single Output
- UL94-V0 Package
- No Heat Sink Required
- Industry Standard Pin out
- MTBF>1,000,000 hours
- Custom Service Available
- RoHS Compliance

### APPLICATIONS

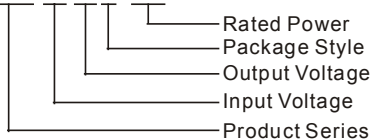
The WRF\_P-3W Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

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 =3000VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

### MODEL SELECTION

WRF0512P-3W



### PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (% Typ)	Package Style
	Voltage (VDC)			Voltage (VDC)	Current (mA)			
	Nominal	Range	Max*		Max	Min		
WRF0505P-3W	5	4.5~9VDC	11	5	600	60	74	DIP
WRF0509P-3W	5	4.5~9VDC	11	9	330	33	75	DIP
WRF0512P-3W	5	4.5~9VDC	11	12	250	25	76	DIP
WRF0515P-3W	5	4.5~9VDC	11	15	200	20	78	DIP
WRF1205P-3W	12	9~18VDC	22	5	600	60	78	DIP
WRF1209P-3W	12	9~18VDC	22	9	330	33	79	DIP
WRF1212P-3W	12	9~18VDC	22	12	250	25	80	DIP
WRF1215P-3W	12	9~18VDC	22	15	200	20	81	DIP
WRF1505P-3W	15	12~24VDC	30	5	600	60	77	DIP
WRF1509P-3W	15	12~24VDC	30	9	330	33	80	DIP
WRF1512P-3W	15	12~24VDC	30	12	250	25	82	DIP
WRF1515P-3W	15	12~24VDC	30	15	200	20	83	DIP
WRF2405P-3W	24	18~36VDC	40	5	600	60	78	DIP
WRF2409P-3W	24	18~36VDC	40	9	330	33	82	DIP
WRF2412P-3W	24	18~36VDC	40	12	250	25	82	DIP
WRF2415P-3W	24	18~36VDC	40	15	200	20	83	DIP
WRF4805P-3W	48	36~72VDC	80	5	600	60	78	DIP
WRF4809P-3W	48	36~72VDC	80	9	330	33	82	DIP
WRF4812P-3W	48	36~72VDC	80	12	250	25	82	DIP
WRF4815P-3W	48	36~72VDC	80	15	200	20	83	DIP

### ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Flash tested for 60 seconds	3000			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
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	% / °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.



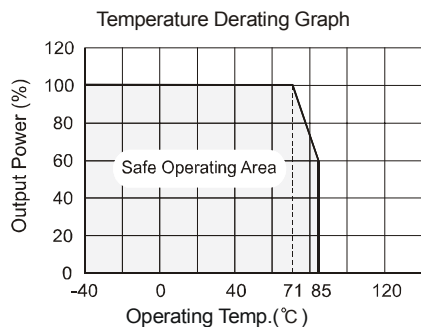
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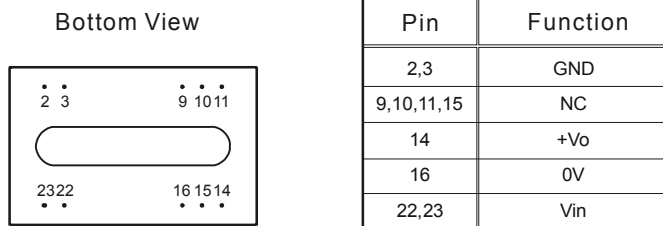
## COMMON SPECIFICATION

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.	

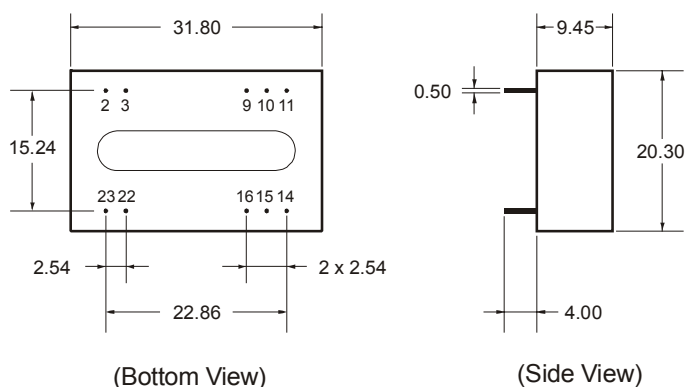
## TYPICAL CHARECTERISTICS



## FOOTPRINT DETAILS



## OUTLINE DIMENSIONS & RECOMMENDED FOOTPRINT



Note: All Pins on a 2.54mm pitch; All Pin diameters are 0.50 mm(Tolerance: ±0.10);

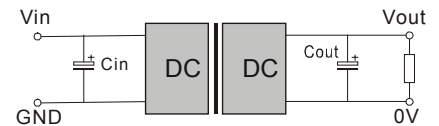
## APPLICATION NOTE

### Recommended Circuit

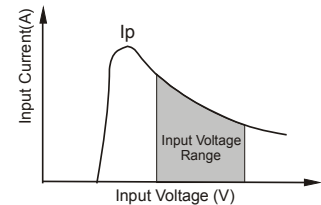
All the WRF\_P-3W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load. Never be tested under no load (See Figure 1 & 2). If you want to further decrease the input/output ripple, you can increase capacitance properly 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)



(Figure 2)

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 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(Table 1)

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



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