



## WRD\_(M)P-3W Series

### 3W, WIDE INPUT ISOLATED & REGULATED TWIN OUTPUT DIP DC-DC CONVERTER

multi-country patent protection **RoHS**

#### FEATURES

- Wide (2:1) Input Range
- Twin output
- Operating Temperature: -40°C to+85°C
- UL94-V0 Package
- No external component required
- Industry Standard Pin out
- Short Circuit Protection(automatic recovery)
- Five-sided metal shielding(WRD\_MP)
- MTBF>1,000,000 hours
- No Heat Sink Required
- RoHS Compliance

#### APPLICATIONS

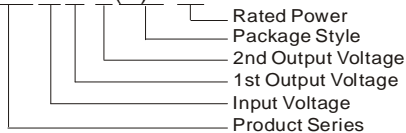
The WRD\_(M) P-3W Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is wide range (voltage range  $\leq 2:1$ );
- 2) Where isolation is necessary between (Isolation Voltage  $\leq 1000\text{VDC}$ );
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

#### MODEL SELECTION

WRD051212(M)P-3W



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#### PRODUCT PROGRAM

Part Number	Input			No-load Current (mA, Typ)	Output		Efficiency (% Typ)	
	Voltage (VDC)				Voltage (VDC)	Current(mA)		
	Nominal	Range	Max*			Max		Min
WRD050505(M)P-3W	5	4.5-9.0	11	40	5	300	30	68
WRD050909(M)P-3W					9	166	16	70
WRD051212(M)P-3W					12	125	12	72
WRD051515(M)P-3W					15	100	10	73
WRD052424(M)P-3W					24	62	6	72
WRD120505(M)P-3W	12	9.0-18	22	20	5	300	30	74
WRD120909(M)P-3W					9	166	16	76
WRD121212(M)P-3W					12	125	12	80
WRD121515(M)P-3W					15	100	10	79
WRD122424(M)P-3W					24	62	6	81
WRD240505(M)P-3W	24	18-36	40	10	5	300	30	76
WRD240909(M)P-3W					9	166	16	78
WRD241212(M)P-3W					12	125	12	82
WRD241515(M)P-3W					15	100	10	80
WRD242424(M)P-3W					24	62	6	82
WRD480505(M)P-3W	48	36-72	80	5	5	300	30	76
WRD480909(M)P-3W					9	166	16	78
WRD481212(M)P-3W					12	125	12	80
WRD481515(M)P-3W					15	100	10	79
WRD482424(M)P-3W					24	62	6	82

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

Note: The load shouldn't be less than 10%, otherwise ripple will increase dramatically.

Operation under 10% load will not damage the converter; However, they may not meet all specification listed.

#### OUTPUT SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Output power	Refer to below product program	0.3		3	W
Main output voltage accuracy	Refer to recommended circuit		$\pm 1$	$\pm 3$	%
Vice-output voltage accuracy	Refer to recommended circuit		$\pm 3$	$\pm 5$	
Load Regulation	From 10% to 100% load		$\pm 0.5$	$\pm 1^*$	
Line Regulation	Input voltage from low to high		$\pm 0.2$	$\pm 0.5$	
Temperature Drift(Vout)	Refer to recommended circuit			$\pm 0.03$	%/°C
Ripple**	20MHz Bandwidth		20	50	mVp-p
Noise**	20MHz Bandwidth		75	150	
Switching Frequency	100% load, nominal Input voltage		300		KHz
Isolation Capacitance			100		PF

\*Dual output models unbalanced load:  $\pm 5\%$ .

\*\*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

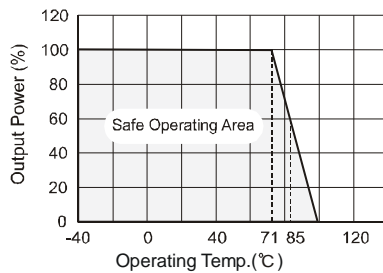
Note:

1. All specifications measured at  $T_A=25^\circ\text{C}$ , humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.

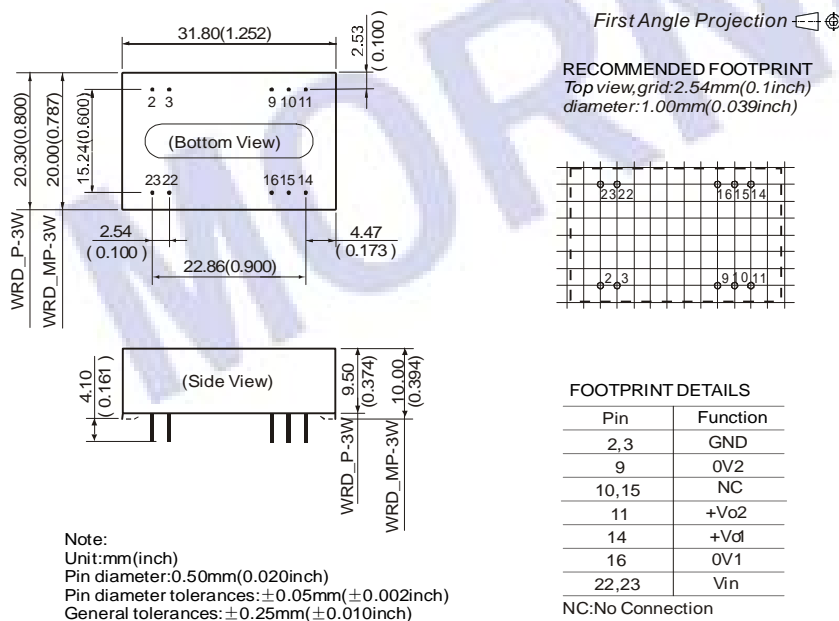
## COMMON SPECIFICATION

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	
Cooling	Free Air Convection				
Case Material	P: Plastic (UL94-V0) MP: Steel, Nickel Plated				
Short circuit protection	Continuous, Automatic Recovery				
Isolation voltage		1500			VDC
Isolation resistance		1000			MΩ
MTBF		1000			K hours
Weight			15		g

## TYPICAL CHARACTERISTICS

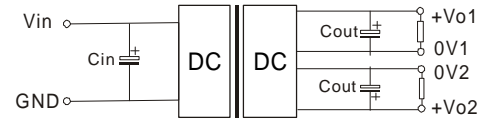


## OUTLINE DIMENSIONS & FOOTPRINT DETAILS



## Recommended Circuit

All the WRD\_(M)P-3W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load (see Figure 1).



(Figure 1)

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, or may cause start-up problem. If you want to use the products in high EMI, please choose our metal packaged products(WRD\_MP-3W). 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 22/10μF

Cout: 10μF/100mA

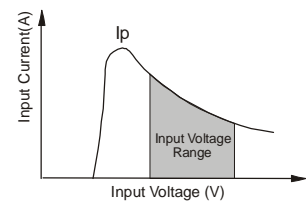
Output External Capacitor Table (Table 1)

Vout(VDC)	Cout(μF)
5	680
9	470
12	330
15	220
24	100

## Input current

While using unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current Ip (Figure 2).

General:  $I_p \leq 1.4 * I_{in-max}$



(Figure 2)

## APPLICATION NOTE

### 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.

**No parallel connection or plug and play.**