

## WRD\_(M)P-3W Series 3W, WIDE INPUT ISOLATED & REGULATED TWIN OUTPUT DIP DC-DC CONVERTER



Patent Protection RoHS

### FEATURES

- 2:1 wide input voltage range
- Twin output
- Operating temperature: -40°C to+85°C
- UL94-V0 package
- No external component required
- Industry standard pinout
- Short circuit protection (automatic recovery)
- Five-sided metal shielding(WRD\_MP)
- MTBF>1,000,000 hours
- No heat sink required
- RoHS Compliance

### APPLICATIONS

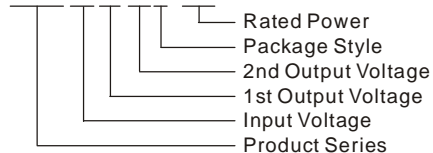
The WRD\_(M)P-3W series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

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 input and output (Isolation Voltage  $\leq 1500\text{VDC}$ );
- 3) Where isolation is necessary between Vout1 and Vout2 (Isolation Voltage  $\leq 1000\text{VDC}$ );
- 4) Where the regulation of the output voltage and the output ripple noise are demanded.

### MODEL SELECTION

WRD050505P-3W



### PRODUCT PROGRAM

Part Number	Input				Output			Efficiency (% , Typ.)
	Voltage (VDC)			No-load Current (mA, Typ)	Voltage (VDC)	Current(mA)		
	Nomina	Range	Max.*			Max.	Min.	
WRD050505(M)P-3W	5	4.5-9.0	11	40	5/5	300/300	30/30	68
WRD051212MP-3W					12/12	125/125	12/12	71
WRD051515P-3W					15/15	100/100	10/10	72
WRD120505(M)P-3W	12	9.0-18	22	20	5/5	300/300	30/30	76
WRD120909(M)P-3W					9/9	166/166	16/16	78
WRD121212MP-3W					12/12	125/125	12/12	80
WRD121515(M)P-3W	12	9.0-18	22	20	15/15	100/100	10/10	81
WRD122424(M)P-3W					24/24	62/62	6/6	82
WRD240505(M)P-3W					5/5	300/300	30/30	76
WRD240512(M)P-3W	24	18-36	40	10	5/12	300/125	30/12	77
WRD241212(M)P-3W					12/12	125/125	12/12	80
WRD241515P-3W					15/15	100/100	10/10	79
WRD242424(M)P-3W	24	18-36	40	10	24/24	62/62	6/6	81
WRD480505(M)P-3W					5/5	300/300	30/30	76
WRD480512MP-3W					5/12	400/83	40/8	78
WRD480909MP-3W	48	36-72	80	5	9/9	166/166	16/16	78
WRD481212P-3W					12/12	125/125	12/12	80
WRD481515(M)P-3W					15/15	100/100	10/10	81
WRD482424MP-3W	48	36-72	80	5	24/24	62/62	6/6	82

Note:\* 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	
Cooling	Free Air Convection				
Case Material	P: Plastic (UL94-V0) MP: Stainless steel				
Short circuit protection	Continuous, Automatic Recovery				
MTBF		1000			K hours
Weight			15		g

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## ISOLATION SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1mAmax	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/1V		100		pF

## OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Output power	Refer to product program	0.3		3	W
Main output voltage accuracy	Refer to recommended circuit		±1	±3	%
Vice-output voltage accuracy	Refer to recommended circuit		±3	±5	
Load regulation	From 10% to 100% load		±0.5	±1*	
Line regulation	Input voltage from low to high		±0.2	±0.5	
Temperature drift (Vout)	Refer to recommended circuit			±0.03	%/°C
Ripple**	20MHz Bandwidth		20	50	mVp-p
Noise**	20MHz Bandwidth		75	150	
Switching frequency	100% load, input voltage range		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 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).

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 22μF/10μF

Cout: 10μF/100mA

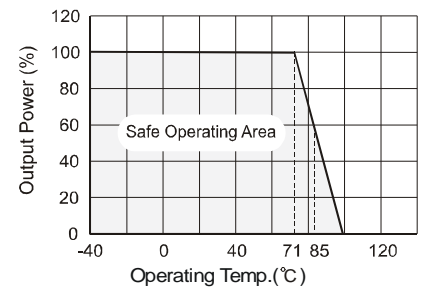
### 3) Input current

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

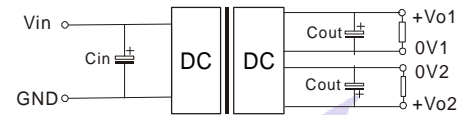
General:  $I_p \leq 1.4 * I_{in-max}$

### 4) No parallel connection or plug and play

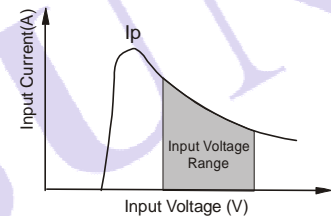
## TYPICAL CHARACTERISTICS



## RECOMMENDED CIRCUIT



(Figure 1)

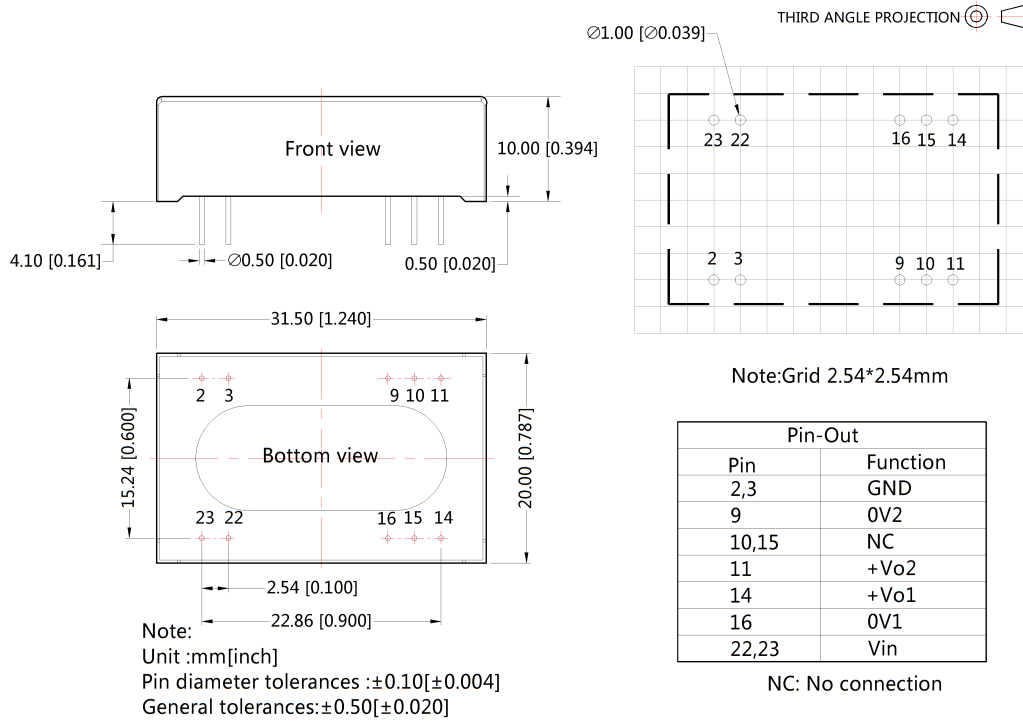


(Figure 2)

Output External Capacitor Table (Table 1)

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

## OUTLINE DIMENSIONS & FOOTPRINT DETAILS



### 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.