

## WRA\_YMD-6W & WRB\_YMD-6W Series

### 6W, WIDE INPUT ISOLATED & REGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER

multi-country patent protection **RoHS**

#### FEATURES

- Efficiency up to 86%
- DIP Package
- Operating Temperature: -40°C to +85°C
- 1.5KVDC Isolation
- Metal Case Package
- No Heat sink Required
- Industry Standard Pin out
- MTBF>1,000,000 hours
- RoHS Compliance

#### APPLICATIONS

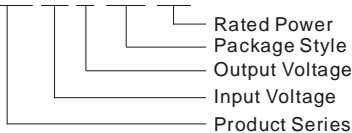
The WRA\_YMD-6W/WRB\_YMD-6W Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

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 the regulation of the output voltage and the output ripple noise are demanded.

#### MODEL SELECTION

WRA2415YMD-6W



#### PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (% Typ)
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max*		Max	Min	
WRA0505YMD-6W	5	4.5-9	11	±5	±600	±60	76
WRA0512YMD-6W				±12	±250	±25	80
WRA0515YMD-6W				±15	±200	±20	82
WRB0505YMD-6W				5	1200	120	76
WRB0512YMD-6W				12	500	50	80
WRB0515YMD-6W				15	400	40	82
WRA1205YMD-6W	12	9-18	20	±5	±600	±60	79
WRA1212YMD-6W				±12	±250	±25	82
WRA1215YMD-6W				±15	±200	±20	84
WRA1224YMD-6W				±24	±125	±13	82
WRB1205YMD-6W				5	1200	120	79
WRB1212YMD-6W				12	500	50	82
WRB1215YMD-6W	15	400	40	84			
WRB1224YMD-6W	24	250	25	82			
WRA2405YMD-6W	24	18-36	40	±5	±600	±60	81
WRA2412YMD-6W				±12	±250	±25	84
WRA2415YMD-6W				±15	±200	±20	86
WRA2424YMD-6W				±24	±125	±13	84
WRB2403YMD-6W				3.3	1500	150	78
WRB2405YMD-6W				5	1200	120	80
WRB2412YMD-6W	12	500	50	84			
WRB2415YMD-6W	15	400	40	86			
WRB2424YMD-6W	24	250	25	85			
WRA4805YMD-6W	48	36-72	80	±5	±600	±60	80
WRA4812YMD-6W				±12	±250	±25	84
WRA4815YMD-6W				±15	±200	±20	85
WRA4824YMD-6W				±24	±125	±13	86
WRB4803YMD-6W				3.3	1500	150	78
WRB4805YMD-6W				5	1200	120	80
WRB4812YMD-6W	12	500	50	84			
WRB4815YMD-6W	15	400	40	86			
WRB4824YMD-6W	24	250	25	85			

\*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 SPECIFICATION

Item	Test Conditions	Min	Typ	Max	Units
Output Power	See above products program	0.6		6	W
Positive Voltage Accuracy	Refer to recommended circuit		±1	±3	%
Negative Voltage Accuracy	Refer to recommended circuit		±3	±5	
Load Regulation	From 10% To 100% load		±0.5	±1*	
Line Regulation(at full load)	Input voltage from low to high		±0.2	±0.5	
Temperature Drift(Vout)	Refer to recommended circuit		0.02		%/°C
Ripple**	20MHz bandwidth		20	50	mVp-p
Noise**	20MHz bandwidth		50	100	
Switching Frequency	100% load, nominal Input voltage		300		KHz

\* 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.

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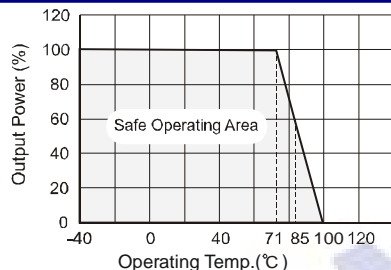
## COMMON SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Storage Humidity Range				95	%
Operating temperature		-40		85	°C
Storage Temperature		-55		125	
Lead Temperature	1.5mm from case for 10 seconds			300	
Temp. Rise at Full Load			40		
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output		100		pF
No-load power consumption			500		mW
Cooling	Free Air Convection				
Short Circuit Protection	Continuous, automatic recovery				
Case Material	Aluminium alloy				
MTBF		1000			K hours
Weight			15		g

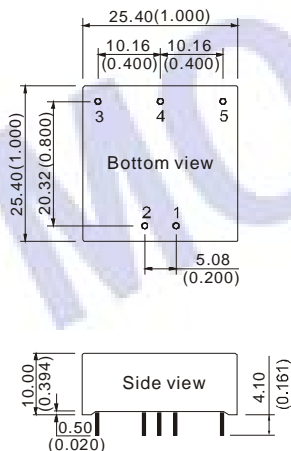
Note:

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

## TYPICAL CHARACTERISTICS



## OUTLINE DIMENSIONS & FOOTPRINT DETAILS



Note:

- Unit:mm(inch)  
 Pin diameter:0.80mm(0.031inch)  
 Pin diameter tolerances:±0.05mm(±0.002inch)  
 General tolerances:±0.25mm(±0.010inch)

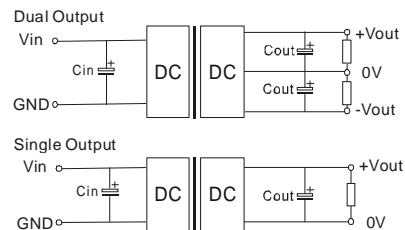
## APPLICATION NOTE

### 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.

## Recommended Circuit

All the WRA\_YMD-6W & WRB\_YMD-6W 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).



(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 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

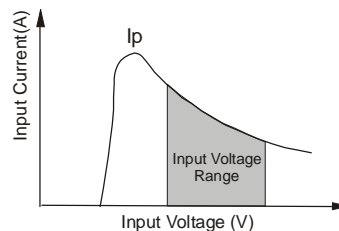
Output External Capacitor Table (Table 1)

Single Vout (VDC)	Cout (uF)	Dual Vout (VDC)	Cout (uF)
3.3	2200	±5	680
5	1000	±9	470
9	680	±12	330
12	470	±15	220
15	330	-	-
24	220	-	-

## 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. (Figure 2).

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



(Figure 2)

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