



FEATURES

- ◆ Wide (2:1) Input Range
- ◆ Short Circuit Protection(automatic recovery)
- ◆ 1500VDC Isolation
- ◆ Operating Temperature: -40℃ ~ +85℃
- ◆ No heat sink required
- ◆ No external component required
- ◆ Internal SMD required
- ◆ Five sided metal shielding
- ◆ MTBF>1000Khours

MODEL SELECTION

WRB^①48^②05^③Y^④M^⑤D^⑥-3W^⑦

- ① Product Series
- ② Input Voltage
- ③ Output Voltage
- ④ Wide (2:1) Input Range
- ⑤ Metal Shield
- ⑥ DIP Package Style
- ⑦ Rated Power

APPLICATIONS

The WRA_YMD-3W&WRB_YMD-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≤1500VDC);
- 3) Where the regulation of the Output voltage and the output ripple noise are demanded.



CE REACH

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SELECTION GUIDE

Order code	Input			Output			Efficiency (%,Typ)
	Voltage(VDC)			Voltage (VDC)	Current(mA)		
	Nominal	Range	Max*		Max.	Min.	
WRA0505YMD-3W	5	4.5-9	11	±5	±300	±30	68
WRA0512YMD-3W	5	4.5-9	11	±12	±125	±12	72
WRA0515YMD-3W	5	4.5-9	11	±15	±100	±10	71
WRB0505YMD-3W	5	4.5-9	11	5	600	60	68
WRB0512YMD-3W	5	4.5-9	11	12	250	25	72
WRB0515YMD-3W	5	4.5-9	11	15	200	20	71
WRA1205YMD-3W	12	9-18	22	±5	±300	±30	76
WRA1212YMD-3W	12	9-18	22	±12	±125	±12	80
WRA1215YMD-3W	12	9-18	22	±15	±100	±10	80
WRB1205YMD-3W	12	9-18	22	5	600	60	77
WRB1209YMD-3W	12	9-18	22	9	333	33	78
WRB1212YMD-3W	12	9-18	22	12	250	25	80
WRB1215YMD-3W	12	9-18	22	15	200	20	81
WRB1224YMD-3W	12	9-18	22	24	125	12	80
WRA2405YMD-3W	24	18-36	40	±5	±300	±30	77
WRA2412YMD-3W	24	18-36	40	±12	±125	±12	80
WRA2415YMD-3W	24	18-36	40	±15	±100	±10	80
WRB2405YMD-3W	24	18-36	40	5	600	60	77
WRB2409YMD-3W	24	18-36	40	9	333	33	79
WRB2412YMD-3W	24	18-36	40	12	250	25	81
WRB2415YMD-3W	24	18-36	40	15	200	20	81
WRB2424YMD-3W	24	18-36	40	24	125	12	80
WRA4805YMD-3W	48	36-72	80	±5	±300	±30	77
WRA4812YMD-3W	48	36-72	80	±12	±125	±12	80
WRA4815YMD-3W	48	36-72	80	±15	±100	±10	81
WRB4805YMD-3W	48	36-72	80	5	600	60	77
WRB4809YMD-3W	48	36-72	80	9	333	33	79
WRB4812YMD-3W	48	36-72	80	12	250	25	81
WRB4815YMD-3W	48	36-72	80	15	200	20	81
WRB4824YMD-3W	48	36-72	80	24	125	12	80
WRB11012YMD-3W	110	72-144	155	12	250	25	80
WRB11024YMD-3W	110	72-144	155	24	125	12	78

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

TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Output power	Refer to products program	0.3		3	W
Positive voltage accuracy	Refer to recommended circuit		± 1	± 3	%
Negative voltage accuracy	Refer to recommended circuit		± 3	± 5	%
Load regulation	Form 10% to 100% load		± 0.5	$\pm 1^*$	%
Line regulation	Input voltage from low to high		± 0.2	± 0.5	%
Temperature drift (Vout)	Refer to recommended circuit			± 0.03	%/ $^{\circ}\text{C}$
Ripple & Noise**	20MHz Bandwidth		75	150	mVp-p
Switching frequency	100% load, input voltage range		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.

COMMON SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40	± 1	85	$^{\circ}\text{C}$
Storage temperature		-55	± 3	125	$^{\circ}\text{C}$
Temp. rise at full load			15		$^{\circ}\text{C}$
Lead temperature	1.5mm from case for 10 seconds			300	$^{\circ}\text{C}$
Cooling		Free Air Convection			
Short circuit protection		Continuous, Automatic recovery			
Case material		Aluminium Alloy			
No-load power consumption			0.2		W
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			M Ω
Isolation Capacitance	Input/output		100		pF
MTBF		1000			K hours
Weight			15		g

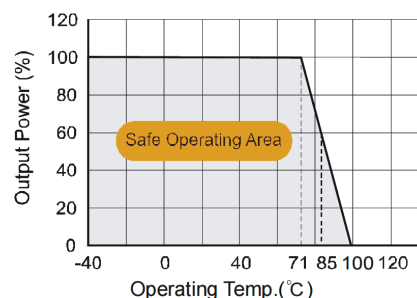
APPLICATION NOTE

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.

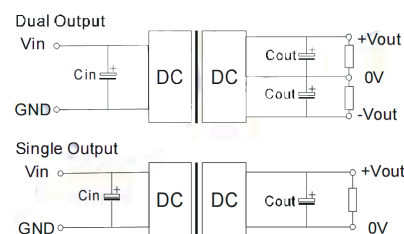
TYPICAL CHARACTERISTICS

Temperature Derating Graph

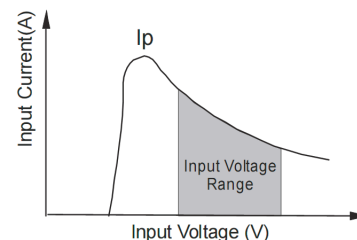


RECOMMENDED CIRCUIT

Output Graph



(Figure 1)



(Figure 2)

Output External Capacitor Table (Table 1)

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

APPLICATION NOTE

Recommended Circuit

All the WRA_YMD-3W&WRB_YMD-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 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 100 μ F
24V&48V 10 μ F-47 μ F

Cout: 10 μ F/100mA

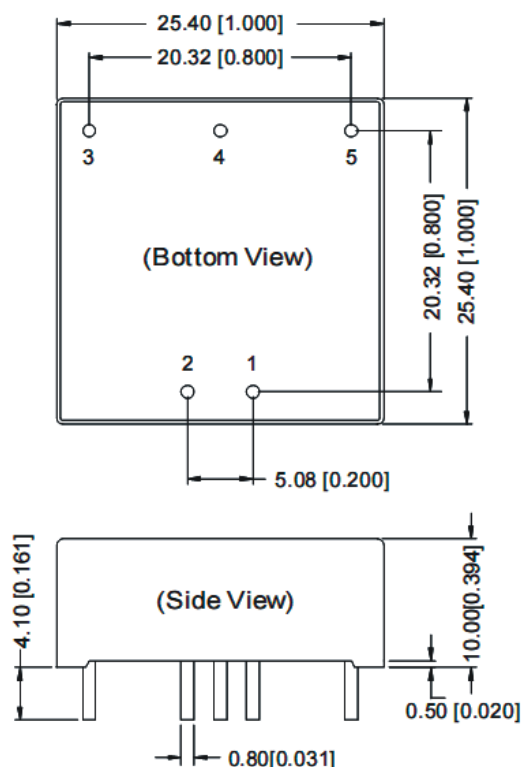
Input current

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 I_p (Figure 2). General: $I_p \leq 1.4 * I_{in-max}$

No parallel connection or plug and play

OUTLINE DIMENSIONS & FOOTPRINT DETAILS

MECHANICAL DIMENSIONS



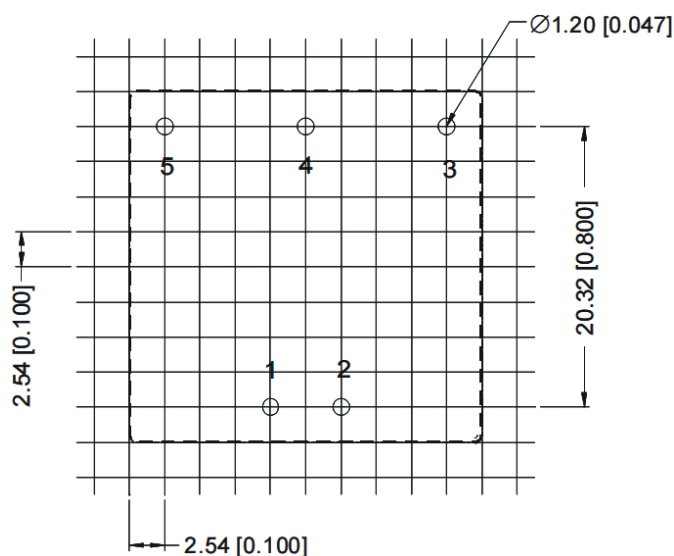
Note:

Unit:mm[inch]

Pin section tolerances: ± 0.10 mm [± 0.004 inch]

General tolerances: ± 0.25 mm [± 0.010 inch]

RECOMMENDED FOOTPRINT



RECOMMENDED FOOTPRINT

Top view, grid: 2.54mm (0.1inch)

diameter: 1.00mm (0.039inch)

OUTLINE DIMENSIONS & FOOTPRINT DETAILS

FOOTPRINT DETAILS

Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	NC	0V
5	0V	-Vo

NC:No connection

When the environment temperature is higher than 71°C, the product output power should be less than 60% of the rated power.

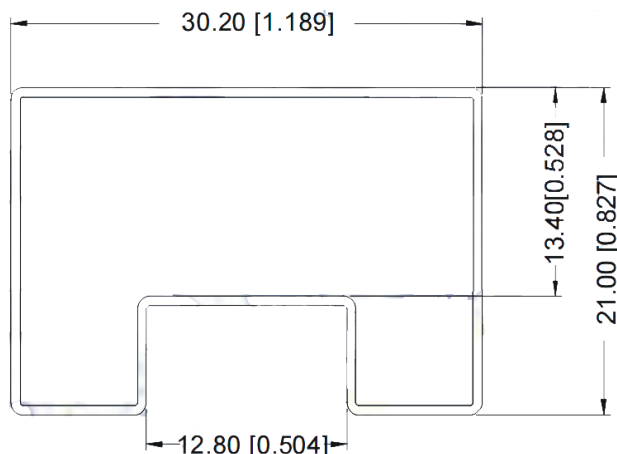
No parallel connection or plug and play.

Use dual output simultaneously, forbid opening output pin (0V) to use as single output.

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 Ta=25°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.

TUBE OUTLINE DIMENSIONS



Note:

Unit :mm[inch]

General tolerances: ±0.50mm[±0.020inch]

L=530mm[20.866inch] Tube Quantity: 19pcs

L=220mm[8.661inch] Tube Quantity: 7pcs

MICRODC

Professional Power Module

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RoHS COMPLIANT INFORMATION

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. The pin termination finish on the SIP package type is Tin Plate, Hot Dipped over Matte Tin with Nickel Preplate. The DIP types are Matte Tin over Nickel Preplate. Both types in this series are backward compatible with Sn/Pb soldering systems.



REACH COMPLIANT INFORMATION

This series has proven that this product does not contain harmful chemicals, it also has harmful chemical substances through the registration, inspection and approval.