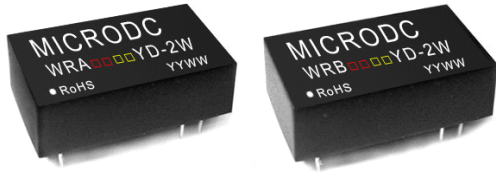


# MICRODC

Professional Power Module

## WRA-YD-2W&WRB-YD-2W Series

2W, WIDE INPUT, ISOLATED & REGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER



### FEATURES

- ◆ Miniature DIP package
- ◆ 2:1 wide input voltage range
- ◆ Operating temperature: -40°C to +85°C
- ◆ 1500VDC isolation
- ◆ No heat sink required
- ◆ No external component required
- ◆ Industry standard pinout
- ◆ Internal SMD construction
- ◆ Short circuit protection (automatic recovery)
- ◆ RoHS Compliance

### MODEL SELECTION

**WRB<sup>①</sup>24<sup>②</sup>05<sup>③</sup>Y<sup>④</sup>D<sup>⑤</sup>-2W<sup>⑥</sup>**

- ① Product Series
- ② Input Voltage
- ③ Output Voltage
- ④ Wide (2:1) Input Range
- ⑤ DIP package style
- ⑥ Rated Power

### APPLICATIONS

The WRA\_YD-2W&WRB\_YD-2W 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  $\leq 1500$ VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

### SELECTION GUIDE

Order code	Input			Output			Efficiency (% Typ)
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max.		Max.	Min.	
WRA1205YD-2W	12	9-18	22	±5	±200	±20	75
WRA1212YD-2W	12	9-18	22	±12	±83	±8	78
WRA1215YD-2W	12	9-18	22	±15	±67	±7	78
WRB1203YD-2W	12	9-18	22	3.3	455	45	70
WRB1205YD-2W	12	9-18	22	5	400	40	74
WRB1209YD-2W	12	9-18	22	9	222	22	76
WRB1212YD-2W	12	9-18	22	12	167	16	78
WRB1215YD-2W	12	9-18	22	15	133	13	78
WRA2405YD-2W	24	18-36	40	±5	±200	±20	76
WRA2412YD-2W	24	18-36	40	±12	±83	±8	78
WRA2415YD-2W	24	18-36	40	±15	±67	±7	79
WRB2403YD-2W	24	18-36	40	3.3	455	45	72
WRB2405YD-2W	24	18-36	40	5	400	40	76
WRB2409YD-2W	24	18-36	40	9	222	22	78
WRB2412YD-2W	24	18-36	40	12	167	16	80
WRB2415YD-2W	24	18-36	40	15	133	13	79

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

### OUTPUT SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	°C
Temp. rise at full load			15		°C
Lead temperature	1.5mm from case for 10 seconds			300	°C
No-load power consumption			0.2		W
Cooling		Free air convection			
Short circuit protection		Continuous, automatic recovery			
Case material		Plastic (UL94-V0)			
MTBF		1000			K hours
Weight			4.8		g

### ISOLATION SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1 mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation Capacitance	Input/Output, 100KHz/1V		85		pF



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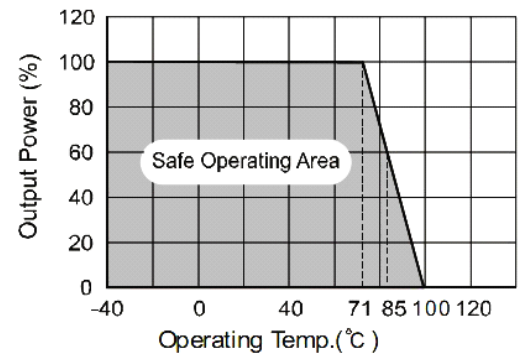
### COMMON SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Output power	See above products program	0.2		2	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	Input voltage from low to high		±0.2	±0.5	%
Temperature drift	Refer to recommended circuit			±0.03	%/°C
Ripple & Noise**	20MHz Bandwidth		50	100	mVp-p
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.

### TYPICAL CHARECTERISTICS



### 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 WRA\_YD-2W & WRB\_YD-2W series have been tested according to the following recommended testing circuit before leaving factory (Figure 1). This series should be tested under load.

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: 12V 100μF  
 24V 10μF~47μF  
 Cout: 10μF/100mA

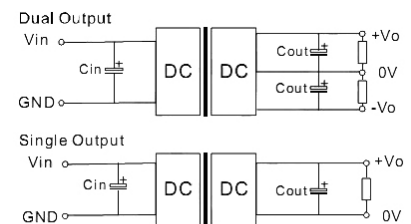
#### 3) Input Current

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)

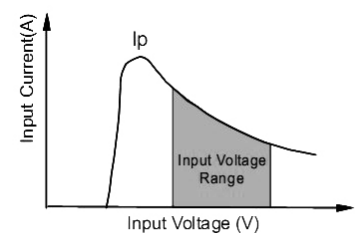
General:  $I_p \leq 1.4 \cdot I_{in-max}$

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

### RECOMMENDED CIRCUIT



(Figure 1)



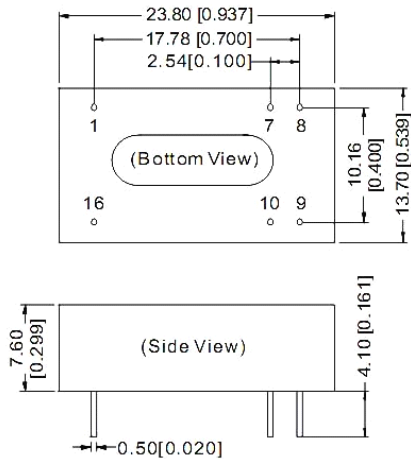
(Figure 2)

Output External Capacitor Table (Table 1)

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

### OUTLINE DIMENSIONS & FOOTPRINT DETAILS

#### MECHANICAL DIMENSIONS

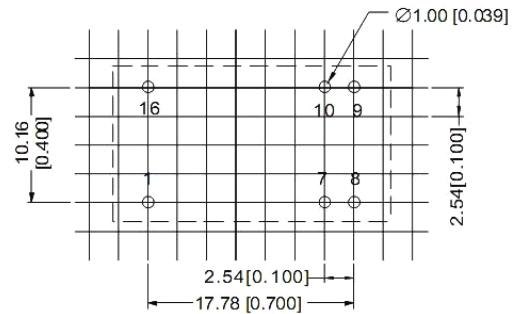


Note:  
Unit:mm[inch]  
Pin section tolerances:  $\pm 0.10\text{mm}$  [  $\pm 0.004\text{inch}$  ]  
General tolerances:  $\pm 0.25\text{mm}$  [  $\pm 0.010\text{inch}$  ]

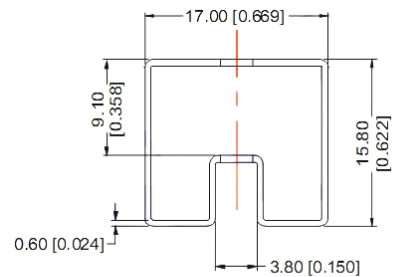
FOOTPRINT DETAILS		
Pin	Single	Dual
1	GND	GND
7	NC	NC
8	NC	0V
9	+Vo	+Vo
10	0V	-Vo
16	Vin	Vin

NC: No connection

#### RECOMMENDED FOOTPRINT(TOP VIEW)



#### TUBE OUTLINE DIMENSIONS



Note:  
Unit :mm[inch]  
General tolerances:  $\pm 0.50\text{mm}$  [  $\pm 0.020\text{inch}$  ]  
L=530mm[20.866inch] Tube Quantity: 21pcs  
L=220mm[8.661inch] Tube Quantity: 8pcs

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.

# 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.