



## 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-YD)
- ◆ MTBF > 1,000,000 hours
- ◆ No heat sink required
- ◆ RoHS Compliance

## MODEL SELECTION

**WRD<sup>①</sup>05<sup>②</sup>05<sup>③</sup>05<sup>④</sup>Y<sup>⑤</sup>D<sup>⑥</sup>-3W<sup>⑦</sup>**

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

## APPLICATIONS

The WRD\_YD-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 isolation is necessary between Vout1 and Vout2 (Isolation Voltage ≤ 1000VDC);
- 4) Where the regulation of the output voltage and the output ripple noise are demanded.



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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.	
WRD050505YD-3W	4.5-9.0	4.5-9.0	11	40	5/5	300/300	30/30	68
WRD051212YD-3W	4.5-9.0	4.5-9.0	11	40	12/12	125/125	12/12	71
WRD051515YD-3W	4.5-9.0	4.5-9.0	11	40	15/15	100/100	10/10	72
WRD120505YD-3W	12	9.0-18	22	20	5/5	300/300	30/30	76
WRD120909YD-3W	12	9.0-18	22	20	9/9	166/166	16/16	78
WRD121212YD-3W	12	9.0-18	22	20	12/12	125/125	12/12	80
WRD121515YD-3W	12	9.0-18	22	20	15/15	100/100	10/10	81
WRD122424YD-3W	12	9.0-18	22	20	24/24	62/62	6/6	82
WRD240505YD-3W	24	18-36	40	10	5/5	300/300	30/30	76
WRD240512YD-3W	24	18-36	40	10	5/12	300/125	30/12	77
WRD241212YD-3W	24	18-36	40	10	12/12	125/125	12/12	80
WRD241515YD-3W	24	18-36	40	10	15/15	100/100	10/10	79
WRD242405YD-3W	24	18-36	40	10	24/05	62/300	6/30	81
WRD242424YD-3W	24	18-36	40	10	24/24	62/62	6/6	81
WRD480505YD-3W	48	36-72	80	5	5/5	300/300	30/30	76
WRD480512YD-3W	48	36-72	80	5	5/12	400/83	40/8	78
WRD480909YD-3W	48	36-72	80	5	9/9	166/166	16/16	78
WRD481212YD-3W	48	36-72	80	5	12/12	125/125	12/12	80
WRD481515YD-3W	48	36-72	80	5	15/15	100/100	10/10	81
WRD482424YD-3W	48	36-72	80	5	24/24	62/62	6/6	82

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

## COMMON SPECIFICATIONS

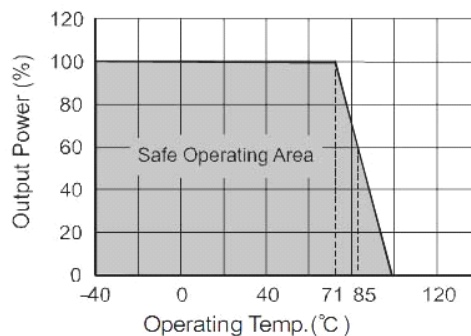
Item	Test Conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage Temperature		-55		125	
Temp. rise at full load			15		
Lead temperature	1.5mm from case for 10 seconds			300	
Cooling	Free Air Convection				
Case Material	Plastic (UL94-V0)				
Short circuit protection	Continuous, Automatic Recovery				
MTBF		1000			K hours
Weight			15		g

### ISOLATION SPECIFICATIONS

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

\*Supply voltage must be discontinued at the end of short circuit duration.

### TYPICAL CHARACTERISTICS



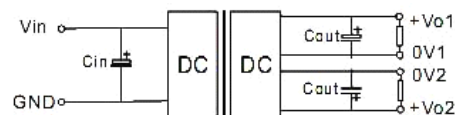
### OUTPUT SPECIFICATIONS

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

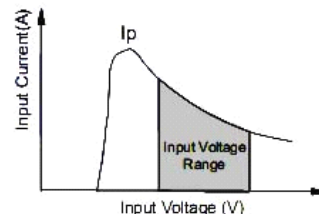
\*Dual output models unbalanced load: ± 5%.

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

### RECOMMENDED CIRCUIT



(Figure 1)



(Figure 2)

### 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-YD-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\_YD-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 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:  $I_p \leq 1.4 \cdot I_{in-max}$

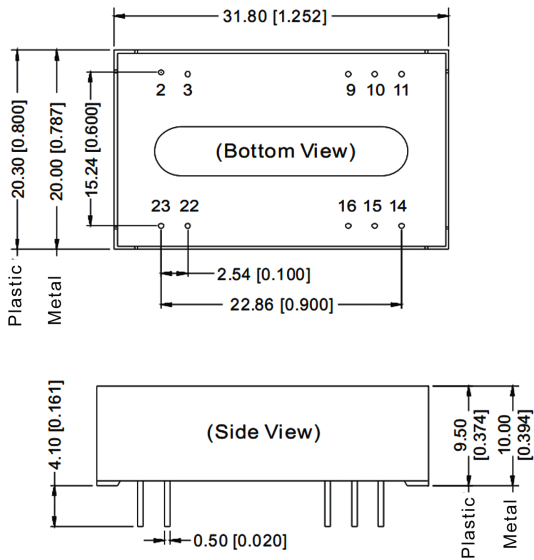
#### 4) No parallel connection or plug and play

EXTERNAL CAPACITOR TABLE (TABLE 1)

Output External Capacitor Table (Table 1)	
Vout(VDC)	Cout(μF)
5	680
9	470
12	330
15	220
24	100

### OUTLINE DIMENSIONS & FOOTPRINT DETAILS

#### MECHANICAL DIMENSIONS

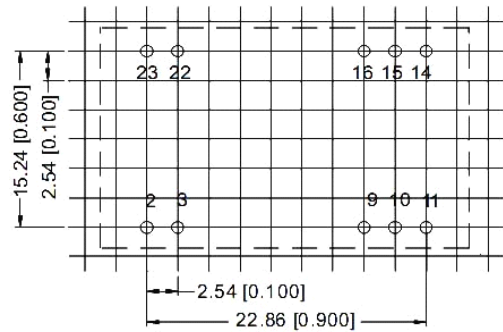


Note:  
 Unit:mm[inch]  
 Pin section tolerances:±0.10mm[±0.004inch]  
 General tolerances:±0.25mm[±0.010inch]

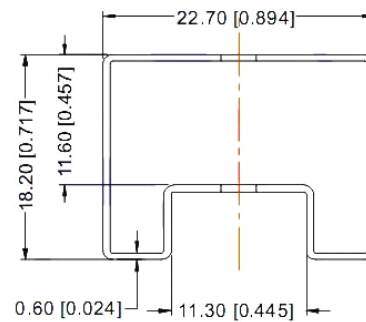
FOOTPRINT DETAILS	
Pin	Function
2,3	GND
9	0V2
10,15	NC
11	+Vo2
14	+Vo1
16	0V1
22,23	Vin

NC: No connection

#### RECOMMENDED FOOTPRINT(TOP VIEW)



#### TUBE OUTLINE DIMENSIONS



Note:  
 Unit :mm[inch]  
 General tolerances:± 0.50mm± 0.020inch]  
 L=530mm[20.866inch] Tube Quantity: 15pcs  
 L=220mm[8.661inch] Tube Quantity: 6pcs

#### 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.