

## FEATURES

- ◆ High Efficiency up to 84%
- ◆ Operating Temperature: -40°C to +85°C
- ◆ 3KVDC Input/Output Isolation
- ◆ Short Circuit Protection(Automatic recovery)
- ◆ Internal SMD construction
- ◆ No Heat Sink Required
- ◆ Industry Standard Pinout
- ◆ MTBF>1,000,000 hours
- ◆ RoHS Compliance

## MODEL SELECTION

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

- ① Product Series    ② Input Voltage  
 ③ Output Voltage 1st   ④ Wide (4:1) Input Range  
 ⑤ DIP24 Package Style    ⑥ Rated Power

## APPLICATIONS

The WRE\_ZD-3W&WRF\_ZD-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≤4:1);
- 2) Where isolation is necessary between input and output (Isolation Voltage≤3000VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.



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## SELECTION GUIDE

Order code	Input			Output		Efficiency (% Typ)	
	Voltage(VDC)			Voltage (VDC)	Current(mA)		
	Nominal	Range	Max.		Max.		Min.
WRE2405ZD-3W	24	9-36	40	±5	±300	±30	80
WRE2412ZD-3W	24	9-36	40	±12	±125	±13	82
WRE2415ZD-3W	24	9-36	40	±15	±100	±10	84
WRE2424ZD-3W	24	9-36	40	±24	±63	±6	87
WRF2403ZD-3W	24	9-36	40	3.3	909	91	78
WRF2405ZD-3W	24	9-36	40	5	600	60	80
WRF2412ZD-3W	24	9-36	40	12	250	25	82
WRF2415ZD-3W	24	9-36	40	15	200	20	84
WRF2424ZD-3W	24	9-36	40	24	125	13	82
WRE4805ZD-3W	48	18-72	80	±5	±300	±30	80
WRE4812ZD-3W	48	18-72	80	±12	±125	±13	82
WRE4815ZD-3W	48	18-72	80	±15	±100	±10	84
WRE4824ZD-3W	48	18-72	80	±24	±63	±6	84
WRF4803ZD-3W	48	18-72	80	3.3	909	91	77
WRF4805ZD-3W	48	18-72	80	5	600	60	80
WRF4812ZD-3W	48	18-72	80	12	250	25	82
WRF4815ZD-3W	48	18-72	80	15	200	20	84
WRF4824ZD-3W	48	18-72	80	24	125	13	84

Note:

- 1.\*Input voltage can't exceed this value, or will cause the permanent damage.
2. The load shouldn't be less than 10%, otherwise ripple will increase dramatically.
3. Operation under 10% load will not damage the converter; However, they may not meet all specification listed.

## ISOLATION SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Output Power	See below 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	From 10% to 100% load		±0.5	±2*	%
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		75	150	mVp-p
Switching Frequency	100% load,nominal Input voltage		300		KHz

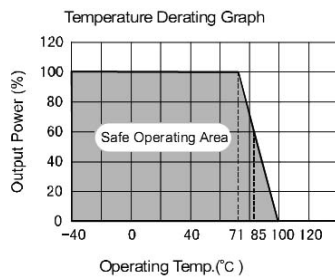
\*Dual output models unbalanced load: ±5%

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

### OUTPUT SPECIFICATIONS

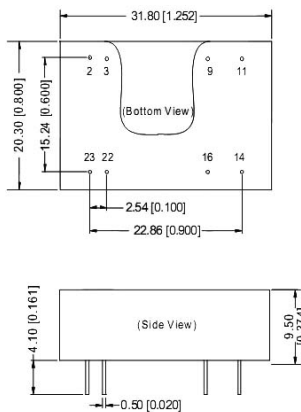
Parameter	Test conditions	Min	Typ.	Max	Uni
Storage Humidity				95	%
Operating Temperature		-40		85	°C
Storage Temperature		-55		125	°C
Temp. rise at full load			40		°C
Lead Temperature	1.5mm from case for 10 seconds			300	°C
Isolation voltage	Tested for 1 minute and 1mA max	3000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
No-load power consumption			500		mW
Cooling		Free air convection			
Case Material		Plastic(UL94-V0)			
Short Circuit Protection		Continuous, automatic recovery			
MTBF		1000			K hours
Weight			17		g

### TYPICAL CHARACTERISTICS



### OUTLINE DIMENSIONS & FOOTPRINT DETAILS

#### MECHANICAL DIMENSIONS



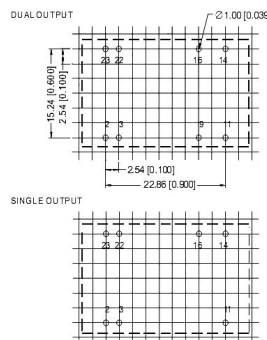
Note:  
Unit:mm[inch]  
Pin diameter tolerances: ±0.10mm[±0.004inch]  
General tolerances: ±0.25mm[±0.010inch]

#### FOOTPRINT DETAILS

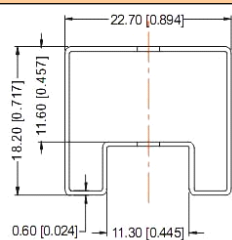
Pin	Single	Dual
2,3	GND	GND
9	No Pin	0V
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V
22,23	Vin	Vin

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

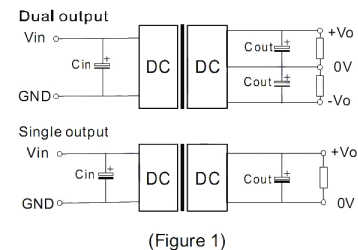
### APPLICATION NOTE

#### Requirement 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 WRE\_ZD-3W&WRF\_ZD-3W Series have been tested according to the following recommended testing circuit before leaving factory. (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: 24V&48V 10μF-47μF

Cout: 10μF/100mA

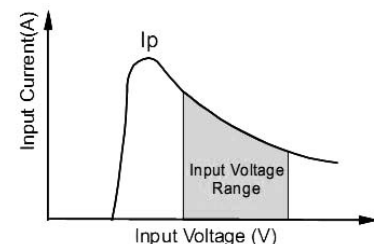
Output External Capacitor Table (Table 1)

Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout (μF)
3.3	2200	±5	680
5	1000	±12	330
12	470	±15	220
15	330	±24	100
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 (See figure 2), General:

$I_p \leq 1.6 \cdot I_{in-max}$



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