

## WRD\_S-1W & WRD\_S-2W Series

### 1W & 2W, WIDE INPUT, TWIN OUTPUT

### DC-DC CONVERTER

multi-country patent protection **RoHS**

#### FEATURES

Miniature SIP Package  
Wide (2:1) Input Range  
Regulated Outputs  
I/O Isolation 1000VDC  
Short Circuit Protection(automatic recovery)  
External On/Off control  
Internal SMD construction  
Operating Temperature: -40°C to +85°C  
RoHS Compliance

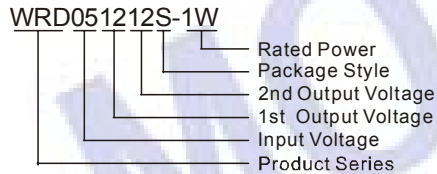
#### APPLICATIONS

The WRD\_S-1W 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 & Vout1 and Vout2(Isolation Voltage≤1000VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

#### MODEL SELECTION



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#### PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (% Typ)
	Voltage (VDC)		No Load (mA)(Typ)	Voltage (VDC)	Current (mA)		
	Nominal	Max*			Max	Min	
WRD050505S-1W	5 (4.5-9.0)	11	40	5	100	10	70
WRD050909S-1W				9	55	5	71
WRD051212S-1W				12	42	4	73
WRD051515S-1W				15	33	3	72
WRD050505S-2W				5	200	20	67
WRD050909S-2W				9	111	11	71
WRD051212S-2W				12	83	8	72
WRD051515S-2W				15	67	7	73
WRD120505S-1W				12 (9.0-18)	22	20	5
WRD120909S-1W	9	55	5				76
WRD121212S-1W	12	42	4				78
WRD121515S-1W	15	33	3				78
WRD120505S-2W	5	200	20				75
WRD120909S-2W	9	111	11				77
WRD121212S-2W	12	83	8				80
WRD121515S-2W	15	67	7				79
WRD240505S-1W	24 (18-36)	40	10				5
WRD240909S-1W				9	55	5	77
WRD241212S-1W				12	42	4	78
WRD241515S-1W				15	33	3	77
WRD240505S-2W				5	200	20	76
WRD240909S-2W				9	111	11	78
WRD241212S-2W				12	83	8	80
WRD241515S-2W				15	67	7	79
WRD480505S-1W				48 (36-72)	48	5	5
WRD480909S-1W	9	55	5				75
WRD481212S-1W	12	42	4				77
WRD481515S-1W	15	33	3				77
WRD480505S-2W	5	200	20				75
WRD480909S-2W	9	111	11				78
WRD481212S-2W	12	83	8				79
WRD481515S-2W	15	67	7				78

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

#### OUTPUT SPECIFICATIONS

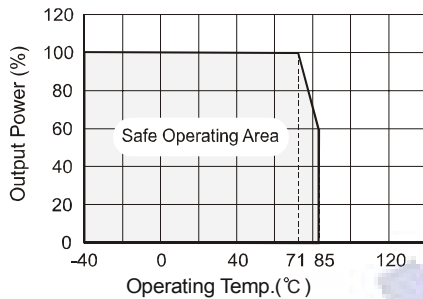
Item	Test Conditions	Min	Typ	Max	Units
Output Voltage Accuracy	Vin Range Refer To Output Load		±1	±3	%
Load Regulation	10% To 100% Load		±0.5	±1	
Line Regulation	Input Voltage From Low To High		±0.2	±0.5	
Temperature Drift (Vout)	Refer To Recommended Circuit			±0.03	%/°C
Ripple Noise	20MHz Bandwidth		30	100	mVp-p
Switching Frequency	Input Voltage Range 100% Load	180-500(PFM)			kHz

## COMMON SPECIFICATION

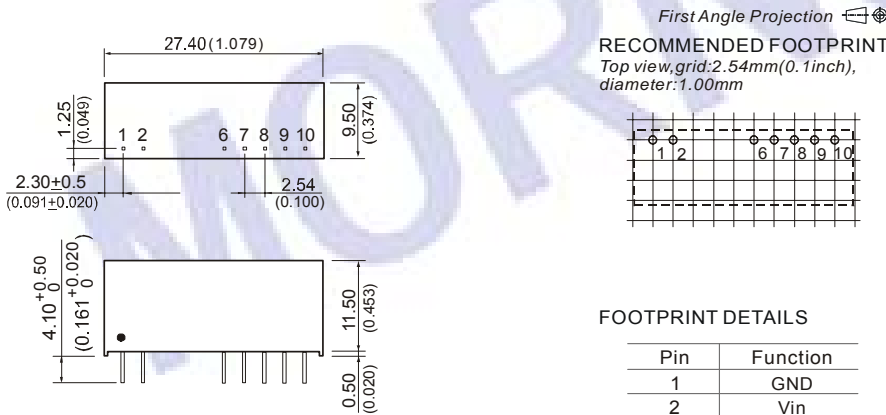
Item	Test Conditions	Min	Typ.	Max	Units
Storage humidity			95		%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Lead temperature			15	35	
Temp. rise at full load	1.5mm from case for 10 seconds			300	
Cooling		Free Air Convection			
Isolation voltage	Tested for 60 seconds	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation Capacitance	100kHz, 1V		80		pF
No-load Power			0.1		W
Short circuit protection		Continuous			
Case material		Plastic(UL94-V0)			
MTBF		1000			K Hours
Weigh			5.8		g

Note:  
 1.All specifications measured at  $T_A=25^{\circ}\text{C}$ , humidity<75%, nominal input voltage and rated output load unless otherwise specified.  
 2.See below recommended circuits for more details.

## TYPICAL TEMPERATURE CURVE



## OUTLINE DIMENSIONS & FOOTPRINT DETAILS



Note:  
 Unit:mm(inch)  
 Pin section:0.50\*0.30mm(0.020\*0.012inch)  
 Pin tolerances:±0.10mm(±0.004inch)  
 General tolerances:±0.25mm(±0.010inch)

## APPLICATION NOTE

### CS Pin

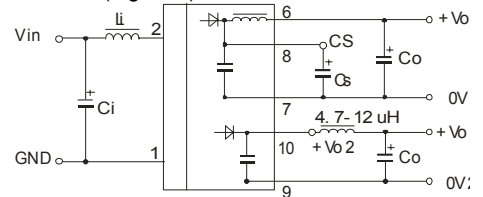
By connecting a low ESR capacitor between this terminal and the pin-7(Figure 1), the output ripple and noise may be further improved. Generally, the capacitance is no greater than 47uF

### Output Load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load is **not less than 10%** of the full load, If the actual load is less than the specified minimum load, the output ripple may increase sharply. 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

If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR (Figure 1).



(Figure 1)

However, the capacitance should not be too high(see Table 1).

Cin: 5V & 12V 100 μF  
 24V & 48V 10 μF-47 μF

Lin: 10 μH~120 μH

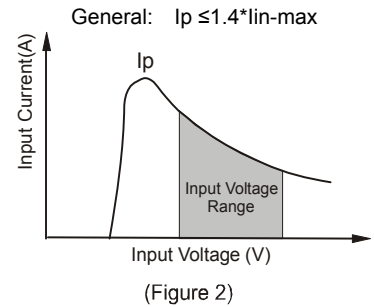
Cout: 100 μF (TYP)

External Capacitor Table(Table 1)

Vout(VDC)	2W:Cout(uF)	1W:Cout(uF)
5	560	330
9	470	270
12	330	220
15	270	180

## 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).



(Figure 2)

No parallel connection or plug and play.