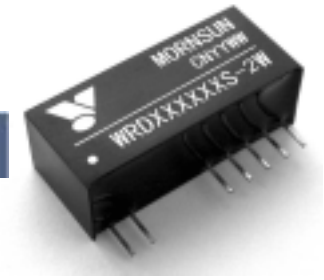
MORNSUN
mini power professional

WRD_S-2W Series



WIDE INPUT ISOLATED & REGULATED 2W OUTPUT TWIN OUTPUT MINIATURE SIP PACKAGE

RoHS
multi-country patent protection

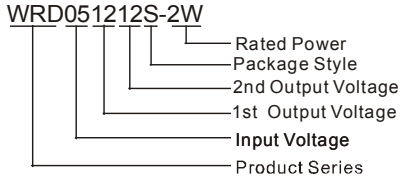
FEATURES

- Wide (2:1) Input Range
- Efficiency to 83%
- Operating Temperature：-40°C~+85°C
- 1KVDC Isolation
- Twin Output
- UL94-V0 Package
- No Heat Sink Required
- Industry Standard Pin out
- MTBF>3,500,000 hours
- Custom Service Available
- RoHS Compliance

APPLICATIONS

The WRD_S-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: 2:1);
2) Where isolation is necessary between input and output
(Isolation Voltage =1000VDC);
3) Where the regulation of the output voltage and the output ripple noise are demanded.

MODEL SELECTION



PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (%, Typ)	Package Style
	Voltage (VDC)			Vo1,Vo2 (VDC)	Io1,Io2 (mA)			
	Nominal	Range	Max*		Max	Min		
WRD050505S-2W	5	4.5~9VDC	11	5	200	20	75	SIP
WRD050909S-2W	5	4.5~9VDC	11	9	111	11	76	SIP
WRD051212S-2W	5	4.5~9VDC	11	12	83	9	78	SIP
WRD051515S-2W	5	4.5~9VDC	11	15	67	7	78	SIP
WRD120505S-2W	12	9~18VDC	22	5	200	20	74	SIP
WRD120909S-2W	12	9~18VDC	22	9	111	11	77	SIP
WRD121212S-2W	12	9~18VDC	22	12	83	9	79	SIP
WRD121515S-2W	12	9~18VDC	22	15	67	7	79	SIP
WRD150505S-2W	15	12~24VDC	30	5	200	20	75	SIP
WRD150909S-2W	15	12~24VDC	30	9	111	11	79	SIP
WRD151212S-2W	15	12~24VDC	30	12	83	9	80	SIP
WRD151515S-2W	15	12~24VDC	30	15	67	7	81	SIP
WRD240505S-2W	24	18~36VDC	40	5	200	20	77	SIP
WRD240909S-2W	24	18~36VDC	40	9	111	11	79	SIP
WRD241212S-2W	24	18~36VDC	40	12	83	9	81	SIP
WRD241515S-2W	24	18~36VDC	40	15	67	7	82	SIP
WRD480505S-2W	48	36~72VDC	80	5	200	20	76	SIP
WRD480909S-2W	48	36~72VDC	80	9	111	11	81	SIP
WRD481212S-2W	48	36~72VDC	80	12	83	9	82	SIP
WRD481515S-2W	48	36~72VDC	80	15	67	7	82	SIP

ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Flash tested for 60 seconds	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
2W Output Power	See Below Products Program	0.2		2	W
Output Voltage Accuracy	Refer To Recommended Circuit		±1	±3	%
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	20Hz-300KHz Bandwidth		40	60	mVp-p
Noise	DC-20MHz Bandwidth		80	150	
Switching Frequency	100% Load, Nominal Input Voltage	80		200	KHz
	10% Load, Nominal Input Voltage	250		600	

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

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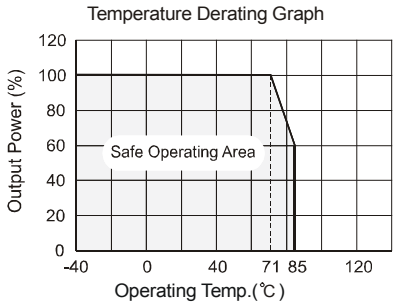
COMMON SPECIFICATION

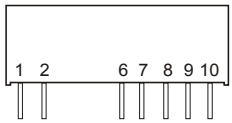
Output Short Circuit Protection	Continuous
Temperature Rise at Full Load	30℃ (TYP)
Cooling	Free Air Convection
No-load Power Consumption	100mW (typical)
Operating Temperature Range	-40℃~+85℃
Storage Temperature Range	-55℃~+125℃
Lead Temperature***	300℃ Max.
Storage Humidity Range	≤ 95%
Case Material	Plastic (UL94-V0)
MTBF	>3,500,000 hours
***Lead Temperature 1.5mm from case for 10 seconds.	

TYPICAL CHARECTERISTICS



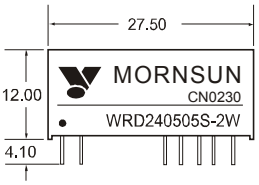
FOOTPRINT DETAILS

Pin	Function
1	GND
2	Vin
6	Voi
7	0V1
8	CS
9	0V2
10	V02



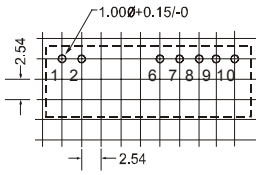
OUTLINE DIMENSIONS & RECOMMENDED FOOTPRINT

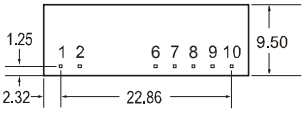
WRDXXXXS-2W Package



Side View

WRDXXXXXXS-2W Footprint





Bottom View

Note: All Pins on a 2.54mm pitch; All Pin diameters are 0.50 mm(Tolerance:±0.25); all dimensions in mm.

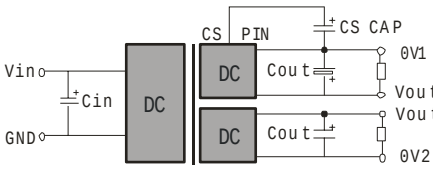
APPLICATION NOTE

Recommended Circuit

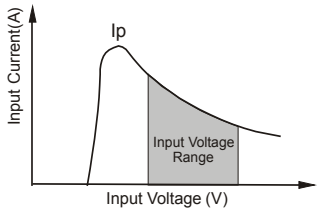
All the WRD_S-2W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load. Never be tested under no load (See Figure 1). If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high.(See table 2).If you want to use the products in high EMI, please choose our metal packaged products.

CS Capacitor Table(Table 1)

Vout	5V	9V	12V	15V
CS	47uF-100uF		22uF-47uF	



(Figure 1)



(Figure 2)

CS Pin

By connecting a low ESR capacitor between this terminal and the pin-7 (connecting to the anode of the capacitor), the output ripple and noise may be further improved. When the output power is down to 1W, it is suggested to connect a capacitor (Cs) between the terminal CS and the terminal 0V. Generally, the capacitance is no greater than 100uF

When the output power is up to 1W, it is suggested to connect a capacitor (Cs) between the CS and the 0V, otherwise perpetual damage might be done. (See Table 1)

Input Current

Nominal input voltage range. The input current of the power supply must be sufficient to the startup current (Ip) of the DC/DC module (see Figure 2)

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% full load, the product never work under no load!*** If the actual load is less than the specified minimum load, the output ripple will increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, a proper resistor is needed at the output end in order to increasing the load, or contact our company for other lower output power products.

No parallel connection or plug and play.

External Capacitor Table(Table 2)

Vin	C_{in}	C_{out} (0+70°C)	C_{out} (-40+85°C)
5V & 12V	100uF	100uF (electrolytic capacitor)	47uF (tantalum capacitor)
24V & 48V	10uF		

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