DC/DC Converter – SWRD_S-1W Series

WIDE INPUT ISOLATED & REGULATED
1W OUTPUT TWIN OUTPUT
MINIATURE SIP PACKAGE

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
- MTBF>3,500,000 hours
- Industry Standard Pin out
- Custom Service Available
- RoHS Compliance

APPLICATIONS

The SWRD_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 (Isolation Voltage =1000VDC);
3) Where the regulation of the output voltage and the output ripple noise are demanding.

PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (%, Typ)
	No.	Voltage (VDC)		Voltage (VDC)	Current (mA)		
		Range	Max*		Max	Min	
SWRD050505S-1W	5	4.5~9	11	5	100	10	63
SWRD050909S-1W	5	4.5~9	11	9	55	6	65
SWRD051212S-1W	5	4.5~9	11	12	42	5	66
SWRD051515S-1W	5	4.5~9	11	15	33	4	66
SWRD120505S-1W	12	9~18	22	5	100	10	71
SWRD120909S-1W	12	9~18	22	9	55	6	75
SWRD121212S-1W	12	9~18	22	12	42	5	77
SWRD121515S-1W	12	9~18	22	15	33	4	79
SWRD150505S-1W	15	12~24	30	5	100	10	75
SWRD150909S-1W	15	12~24	30	9	55	6	78
SWRD151212S-1W	15	12~24	30	12	42	5	80
SWRD151515S-1W	15	12~24	30	15	33	4	81
SWRD240505S-1W	24	18~36	40	5	100	10	75
SWRD240909S-1W	24	18~36	40	9	55	6	78
SWRD241212S-1W	24	18~36	40	12	42	5	80
SWRD241515S-1W	24	18~36	40	15	33	4	81
SWRD480505S-1W	48	36~72	80	5	100	10	75
SWRD480909S-1W	48	36~72	80	9	55	6	77
SWRD481212S-1W	48	36~72	80	12	42	5	80
SWRD481515S-1W	48	36~72	80	15	33	4	81

COMMON SPECIFICATIONS

Short circuit protection	Continuous
Temperature rise at full load	30°C (TYP)
Cooling	Free air convection
No-load Power Consumption	100mW (typical)
Operating Temperature Range	-40°C~+85°C
Storage Temperature Range	-55°C ~+125°C
Storage humidity range	≤ 95%
Case material	Plastic (UL94-V0)
MTBF	>3,500,000 hours
Lead Temperature	300°C (1.5mm from case for 10 seconds)

OUTPUT SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
1W Output Power	See Below Products Program	0.1		1	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-400KHz 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	

MODEL SELECTION

SWRD 05 12 12 S- 1W
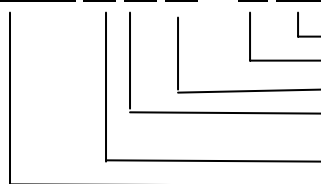
- Rated Power
- Package Style
- 2nd Output Voltage
- 1st Output Voltage
- Input Voltage
- Product Series

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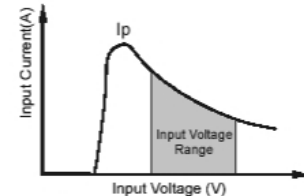
ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ

TYPICAL CHARACTERISTICS

Temperature Derating Graph
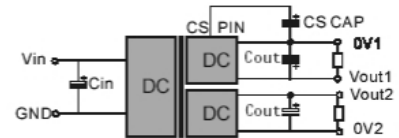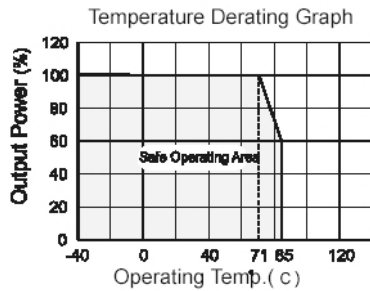
FOOTPRINT DETAILS

Pin	Function
1	GND
2	Vin
6	Voi
7	0V1
8	CS
9	0V2
10	V02
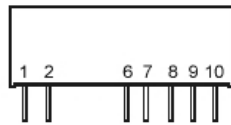
OUTLINE DIMENSIONS & RECONMENDED FOOTPRINT

SWRDXXXXS-1W Package

Side View

SCHMID-M
CN0230
SWRD240505S-1W
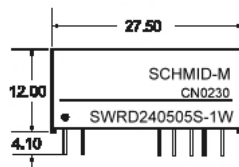
Bottom View

SWRDXXXXXXS-1W Footprint
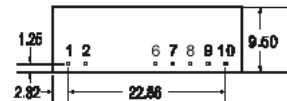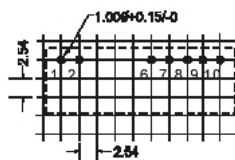
Note: All Pins on a 2.54mm pitch; all pin diameters are 0.50mm; all dimensions in mm. (Tolerance:±0.25);

APPLICATION NOTE

Recommended Circuit

All the SWRD_S-1W Series have been tested according to the following recommended testing circuit before leaving factory. This series should never be operated under no load. (See Figure 1 & 2). 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 1). 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	Cin	Cout (0+70°C)	Cout (-40+85°C)
5V & 12V	100uF	100uF (electrolytic capacitor)	47uF (tantalum capacitor)
24V & 48V	10uF		