

# SWRA\_(M)P-3W & SWRB\_(M)P-3W Series

**3W, 2:1 WIDE INPUT, ISOLATED & REGULATED  
DUAL/SINGLE OUTPUT DIP DC-DC CONVERTER**



multi-country patent protection **RoHS**

## FEATURES

- Wide (2:1) Input Range
- DIP package
- Efficiency Up To 82%
- 1500VDC Isolation
- Short Circuit Protection(automatic recovery)
- Operating Temperature: -40°C to +85°C
- Internal SMD construction
- No Heat Sink Required
- MTBF>1,000,000 hours
- RoHS Compliance

## APPLICATIONS

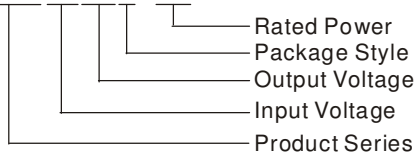
The SWRA\_(M)P-3W & SWRB\_(M)P-3W Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

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 ≤1500VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

## MODEL SELECTION

SWRA0505P-3W



## PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (% Typ)
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max*		Max	Min	
SWRA0505(M)P-3W	5	4.5-9	11	±5	300	30	68
SWRA0509(M)P-3W				±9	166	16	70
SWRA0512(M)P-3W				±12	125	12	72
SWRA0515(M)P-3W				±15	100	10	73
SWRB0505(M)P-3W				5	600	60	68
SWRB0509(M)P-3W				9	333	33	70
SWRB0512(M)P-3W				12	250	25	72
SWRB0515(M)P-3W				15	200	20	73
SWRB0524(M)P-3W				24	125	12	71
SWRA1205(M)P-3W				12	9-18	22	±5
SWRA1209(M)P-3W	±9	166	16				78
SWRA1212(M)P-3W	±12	125	12				79
SWRA1215(M)P-3W	±15	100	10				80
SWRB1205(M)P-3W	5	600	60				78
SWRB1209(M)P-3W	9	333	33				79
SWRB1212(M)P-3W	12	250	25				80
SWRB1215(M)P-3W	15	200	20				81
SWRB1224(M)P-3W	24	125	12				80
SWRA2405(M)P-3W	24	18-36	40				±5
SWRA2409(M)P-3W				±9	166	16	78
SWRA2412(M)P-3W				±12	125	12	79
SWRA2415(M)P-3W				±15	100	10	80
SWRB2403(M)P-3W				3.3	909	90	76
SWRB2405(M)P-3W				5	600	60	78
SWRB2409(M)P-3W				9	333	33	79
SWRB2412(M)P-3W				12	250	25	80
SWRB2415(M)P-3W				15	200	20	81
SWRB2424(M)P-3W				24	125	12	82
SWRA4805(M)P-3W	48	36-72	80	±5	300	30	76
SWRA4809(M)P-3W				±9	166	16	78
SWRA4812(M)P-3W				±12	125	12	79
SWRA4815(M)P-3W				±15	100	10	80
SWRB4803(M)P-3W				3.3	909	90	76
SWRB4805(M)P-3W				5	600	60	78
SWRB4809(M)P-3W				9	333	33	79
SWRB4812(M)P-3W				12	250	25	80
SWRB4815(M)P-3W				15	200	20	81
SWRB4824(M)P-3W				24	125	12	82

\* Input voltage can't exceed this value, or will cause the permanent damage.  
 Note: 1. Metal package style's series is SWRA\_MP-3W & SWRB\_MP-3W.  
 2. The load shouldn't be less than 10%, otherwise they may not meet all specification listed.

## COMMON SPECIFICATION

Item	Test Conditions	Min	Typ	Max	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-50		125	
Temp. rise at full load			15	35	
Lead temperature	1.5mm from case for 10 seconds			300	
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance			85		pF
No-load power			0.2		W
Cooling	Free Air Convection				
Short Circuit Protection	Continuous, Automatic Recovery				
Case Material	P: Plastic (UL94-V0) MP: Steel, Nickel Plated				
MTBF		1000			K hours
Weight			14		g

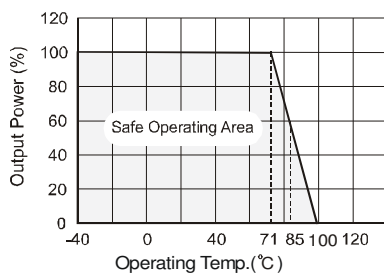
## OUTPUT SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Output power		0.3		3	W
Output voltage accuracy	Refer To Recommended Circuit		±1	±3	%
Load regulation	10% to 100% load SWRB_M(P)-3W		±0.5	±0.75	
	10% to 100% load SWRA_M(P)-3W		±0.5	±1.0	
Line regulation	Input voltage from low to high		±0.2	±0.5	
Temperature drift(Vout)	Refer to recommended circuit			±0.03	mVp-p
Noise & Ripple	20MHz Bandwidth		50	100	
Switching Frequency	100% load, Nominal input voltage		300		KHz

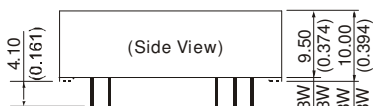
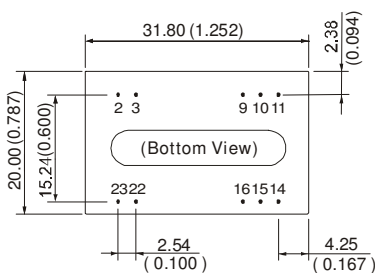
Note:

- All specifications measured at  $T_A=25^{\circ}\text{C}$ , humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.
- See below recommended circuits for more details.

## TYPICAL TEMPERATURE CURVE



## PACKAGE STYLE AND PINNING

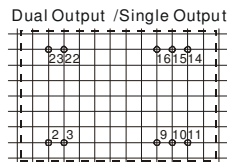


Note:  
 Unit:mm (inch)  
 Pin diameter:0.50mm(0.020inch)  
 Pin diameter tolerances:±0.10mm(±0.004inch)  
 General tolerances:±0.25mm(±0.010inch)

SWRA\_P-3W  
 SWRB\_P-3W  
 SWRA\_MP-3W  
 SWRB\_MP-3W

First Angle Projection

RECOMMENDED FOOTPRINT  
 Top view, grid:2.54mm(0.1inch)  
 diameter:1.00mm(0.039inch)



FOOTPRINT DETAILS

Pin	Single	Dual
2,3	GND	GND
9	NC	0V
10,15	NC	NC
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V
22,23	Vin	Vin

NC:No Connection

## APPLICATION NOTE

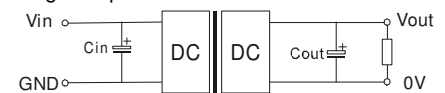
### Requirement on Output Load

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.

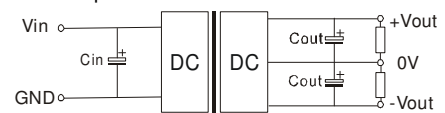
### Recommended circuit

All the SWRA\_(M)P-3W & SWRB\_(M)P-3W 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).

#### Single output



#### Dual output



(Figure 1)

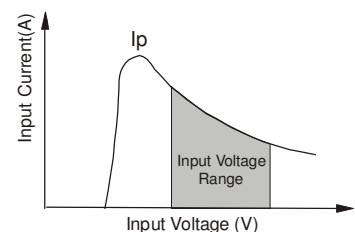
If you want to further decrease the output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high (Table 1).

External Capacitor Table (Table 1)

Vin (VDC)	Cin (uF)	Single Vo (VDC)	Co (uF)	Dual Vc (VDC)
5	100	3.3	2200	±5
12	100	5	1000	±9
24	10-47	9	680	±12
48	10-47	12	470	±15
-	-	15	330	-
-	-	24	220	-

### 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  $I_p$  (Figure 2).  
 General:  $I_p \leq 1.4 \cdot I_{in-max}$



(Figure 2)

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