



SWRA_LT-3W & SWRB_LT-3W Series

3W, WIDE INPUT, ISOLATED & REGULATED SINGLE/DUAL OUTPUT DC/DC CONVERTER



FEATURES

- 2:1 Wide input voltage range
- Operating temperature: -40°C ~ +85°C
- 1500VDC isolation
- No heatsink required
- Internal SMD construction
- MTBF>1,000,000 hours
- Short circuit protection (automatic recovery)
- Industry standard pinout
- RoHS Compliance

APPLICATIONS

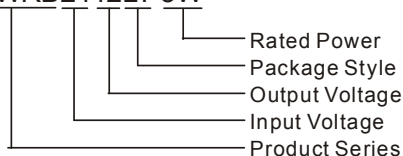
The SWRA_LT-3W & SWRB_LT-3W series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is wide range(voltage range $\leq 2:1$);
- 2) Where isolation is necessary between input and output (isolation voltage $\leq 1500\text{VDC}$);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

MODEL SELECTION

SWRB2412LT-3W



PRODUCT PROGRAM

| Part Number | Input | | | Output | | | Efficiency (% Typ.) |
|----------------|---------------|-------|-------|---------------|--------------|------|---------------------|
| | Voltage (VDC) | | | Voltage (VDC) | Current (mA) | | |
| | Nominal | Range | Max** | | Max. | Min. | |
| SWRA0505LT-3W* | 5 | 4.5-9 | 11 | ±5 | ±300 | ±30 | 72 |
| SWRA0512LT-3W* | | | | ±12 | ±125 | ±13 | 74 |
| SWRA0515LT-3W | | | | ±15 | ±100 | ±10 | 75 |
| SWRB0505LT-3W | | | | 5 | 600 | 60 | 72 |
| SWRB0512LT-3W* | | | | 12 | 250 | 25 | 74 |
| SWRB0515LT-3W | | | | 15 | 200 | 20 | 75 |
| SWRA1205LT-3W | 12 | 9-18 | 22 | ±5 | ±300 | ±30 | 76 |
| SWRA1212LT-3W | | | | ±12 | ±125 | ±13 | 79 |
| SWRA1215LT-3W | | | | ±15 | ±100 | ±10 | 79 |
| SWRB1205LT-3W | | | | 5 | 600 | 60 | 74 |
| SWRB1212LT-3W | | | | 12 | 250 | 25 | 79 |
| SWRB1215LT-3W* | | | | 15 | 200 | 20 | 79 |
| SWRA2405LT-3W | 24 | 18-36 | 40 | ±5 | ±300 | ±30 | 76 |
| SWRA2412LT-3W | | | | ±12 | ±125 | ±13 | 79 |
| SWRA2415LT-3W | | | | ±15 | ±100 | ±10 | 79 |
| SWRB2405LT-3W | | | | 5 | 600 | 60 | 76 |
| SWRB2412LT-3W | | | | 12 | 250 | 25 | 79 |
| SWRB2415LT-3W | | | | 15 | 200 | 20 | 79 |
| SWRA4805LT-3W | 48 | 36-72 | 80 | ±5 | ±300 | ±30 | 76 |
| SWRA4812LT-3W* | | | | ±12 | ±125 | ±13 | 79 |
| SWRA4815LT-3W* | | | | ±15 | ±100 | ±10 | 79 |
| SWRB4805LT-3W | | | | 5 | 600 | 60 | 76 |
| SWRB4812LT-3W | | | | 12 | 250 | 25 | 79 |
| SWRB4815LT-3W | | | | 15 | 200 | 20 | 79 |

*Designing.

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

COMMON SPECIFICATIONS

| Item | Test conditions | Min. | Typ. | Max. | Units |
|--------------------------|--------------------------------|--------------------------------|------|------|---------|
| Storage humidity | | | | 95 | % |
| Operating temperature | | -40 | | 85 | °C |
| Storage temperature | | -55 | | 125 | |
| Temp. rise at full load | | | 15 | | |
| Lead temperature | 1.5mm from case for 10 seconds | | | 300 | |
| Short circuit protection | | Continuous, automatic recovery | | | |
| Cooling | | Free air convection | | | |
| Package material | | Epoxy Resin (UL94-V0) | | | |
| MTBF | | 1000 | | | k hours |
| Weight | | | 5.2 | | g |

ISOLATION SPECIFICATIONS

| Item | Test conditions | Min. | Typ. | Max. | Units |
|-----------------------|---------------------------------|------|------|------|-------|
| Isolation voltage | Tested for 1 minute and 1mA max | 1500 | | | VDC |
| Isolation resistance | Test at 500VDC | 1000 | | | MΩ |
| Isolation capacitance | Input/output, 100KHz/1V | | 1000 | | pF |

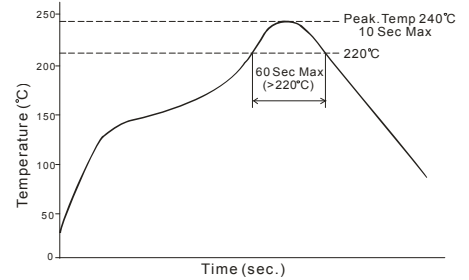
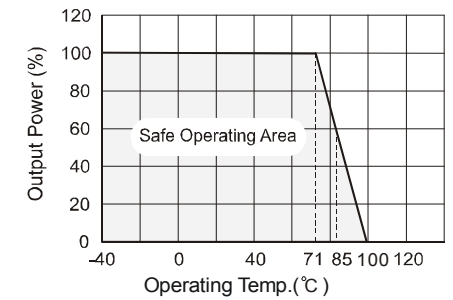
OUTPUT SPECIFICATIONS

| Item | Test conditions | Min. | Typ. | Max. | Units |
|---------------------------|----------------------------------|------|------|-------|-------|
| Output power | See above 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 | ±1* | |
| Line regulation | Input voltage from low to high | | ±0.2 | ±0.5 | |
| Temperature Drift (Vout) | Refer to recommended circuit | | | ±0.03 | %/°C |
| Output ripple & noise** | 20MHz Bandwidth | | 35 | 100 | 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.

TYPICAL TEMPERATURE CURVE



Remark:

The curve applies only to the hot air reflow soldering

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_LT-3W & SWRB_LT-3W series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under 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 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: 5V&12V 100μF
24V&48V 10μF~47μF
Cout: 10μF/100mA

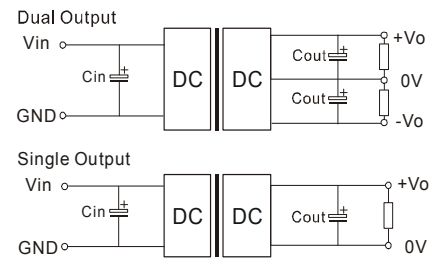
Input Current

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 flash startup current of this kind of DC/DC module (Figure 2), General: $I_p \leq 1.6 \cdot I_{in-max}(V_{in}=5V)$

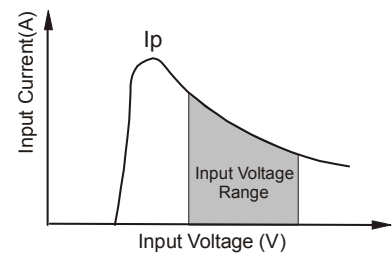
$I_p \leq 1.4 \cdot I_{in-max}(V_{in}=12V/24V/48V)$

No parallel connection or plug and play

RECOMMENDED CIRCUIT



(Figure 1)



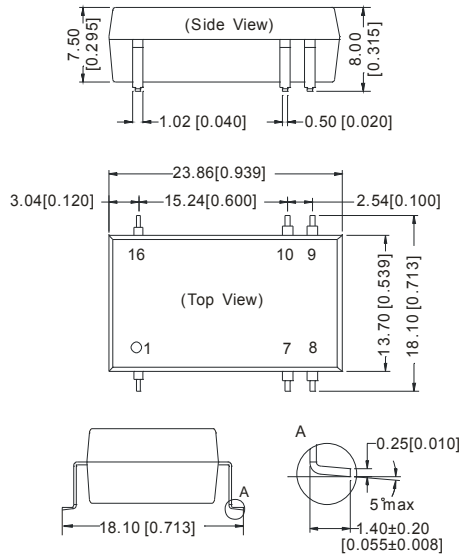
(Figure 2)

Output External Capacitor Table (Table 1)

| Single Vout (VDC) | Cout (μF) | Dual Vout (VDC) | Cout (μF) |
|-------------------|-----------|-----------------|-----------|
| 5 | 1000 | ±5 | 680 |
| 12 | 470 | ±12 | 330 |
| 15 | 330 | ±15 | 220 |

OUTLINE DIMENSIONS & PIN CONNECTIONS

MECHANICAL DIMENSIONS



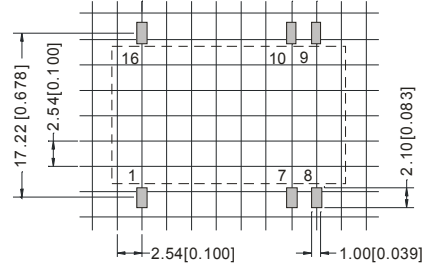
| FOOTPRINT DETAILS | | |
|-------------------|--------|------|
| Pin | Single | Dual |
| 1 | GND | GND |
| 7 | NC | NC |
| 8 | NC | 0V |
| 9 | +Vo | +Vo |
| 10 | 0V | -Vo |
| 16 | Vin | Vin |

NC: No connection

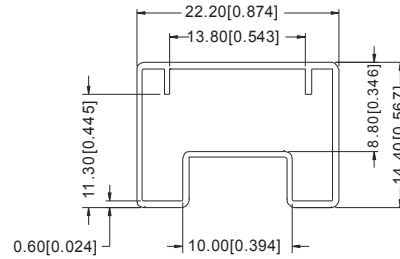
Note:
 Unit: mm[inch]
 Pin section tolerances: $\pm 0.10\text{mm}[\pm 0.004\text{inch}]$
 General tolerances: $\pm 0.25\text{mm}[\pm 0.010\text{inch}]$

RECOMMENDED FOOTPRINT(TOP VIEW)

DUAL/SINGLE OUTPUT



TUBE OUTLINE DIMENSIONS



Note:
 Unit :mm[inch]
 General tolerances: $\pm 0.50\text{mm}[\pm 0.020\text{inch}]$
 L=530mm[20.866inch] pcs/tube: 21
 L=220mm[8.661inch] pcs/tube: 8

Note:

1. The load shouldn't be less than 10%, otherwise ripple will increase dramatically.
2. Operation under 10% load will not damage the converter; However, they may not meet all specification listed.
3. Capacitor MAX load tested at input voltage range and full load.
4. All specifications measured at $T_a=25^\circ\text{C}$, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
5. Only typical models listed, other models may be different, please contact our technical person for more details.
6. In this datasheet, all the test methods of indications are based on corporate standards.