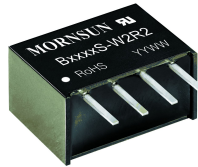


0.25W, Fixed input voltage, isolated & unregulated single output



Continuous Short Circuit Protection



Patent Protection RoHS



FEATURES

- Continuous short-circuit protection
- Operating temperature range: -40°C to +105°C
- Compact SIP package
- Isolation voltage: 1.5K VDC
- No external component required
- International standard pin-out
- IEC60950, UL60950, EN60950 approval

B_S-W2R2 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for

1. Where the voltage of the input power supply is stable (voltage variation: $\pm 10\%V_{in}$);
2. Where isolation between input and output is necessary (isolation voltage $\leq 1500VDC$);
3. Where do not has high requirement of line regulation and the ripple & noise of the output voltage;
4. Typical application: digit circuit condition; normal low-frequency artificial circuit condition; relay drive circuit and data switching circuit condition, etc.

Selection Guide

| Certification | Part No. | Input Voltage (VDC) | Output | | Efficiency (% Min./Typ.) @ Full Load | Max. Capacitive Load (μF) | |
|---------------|-------------|---------------------|----------------------|---------------------------------|--------------------------------------|----------------------------------|--|
| | | Nominal (Range) | Output Voltage (VDC) | Output Current (mA) (Max./Min.) | | | |
| UL/CE/CB | B0303S-W2R2 | 3.3 (2.97-3.63) | 3.3 | 76/7 | 68/74 | 220 | |
| | B0305S-W2R2 | | 5 | 50/5 | 69/75 | | |
| | B0503S-W2R2 | 5 (4.5-5.5) | 3.3 | 76/7 | 68/74 | | |
| | B0505S-W2R2 | | 5 | 50/5 | 70/76 | | |
| | B0512S-W2R2 | | 12 | 21/2 | 71/77 | | |
| | B1205S-W2R2 | 12 (10.8-13.2) | 5 | 50/5 | 60/66 | | |
| | B1505S-W2R2 | 15 (13.5-16.5) | 5 | 50/5 | 60/66 | | |
| | B2405S-W2R2 | 24 | 5 | 50/5 | 63/69 | | |
| | B2409S-W2R2 | 24 (21.6-26.4) | 9 | 28/2 | 60/66 | | |

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|----------------------|------------------|--------|-------|------|
| Input Current (full load / no-load) | 3.3VDC input | -- | 103/20 | --/40 | mA |
| | 5VDC input | -- | 66/15 | --/30 | |
| | 12VDC input | -- | 27/10 | --/20 | |
| | 15VDC input | -- | 25/5 | --/15 | |
| | 24VDC input | -- | 15/4 | --/10 | |
| Reflected Ripple Current* | 3.3V/5V input | -- | 20 | -- | mA |
| | 12V/15V/24V input | -- | 5 | -- | |
| Surge Voltage (1sec. max.) | 3.3VDC input | -0.7 | -- | 5 | VDC |
| | 5VDC input | -0.7 | -- | 9 | |
| | 12VDC input | -0.7 | -- | 18 | |
| | 15VDC input | -0.7 | -- | 21 | |
| | 24VDC input | -0.7 | -- | 30 | |
| Input Filter | | Filter capacitor | | | |
| Hot Plug | | Unavailable | | | |

Note: * Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.

Output Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|--------------------------|---------------------------|---------------|---------------------------------------|-------|------|-------|
| Output Voltage Accuracy | | | See tolerance envelope curve (Fig. 1) | | | |
| Line Regulation | Input voltage change: ±1% | 3.3VDC output | -- | -- | ±1.5 | -- |
| | | Other output | -- | -- | ±1.2 | |
| Load Regulation | 10%-100% load | 3.3VDC output | -- | 7 | 15 | % |
| | | Other output | -- | 5 | 10 | |
| Ripple & Noise* | 20MHz bandwidth | | -- | 25 | 75 | mVp-p |
| Temperature Coefficient | 100% load | | -- | ±0.02 | -- | %/°C |
| Short Circuit Protection | | | Continuous, self-recovery | | | |

Note: * Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation;

General Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|------------------------------------|--|------|------|------|---------|
| Insulation Voltage | Input-output, with the test time of 1 minute and the leak current lower than 1mA | 1500 | -- | -- | VDC |
| Insulation Resistance | Input-output, isolation voltage 500VDC | 1000 | -- | -- | MΩ |
| Isolation Capacitance | Input-output, 100KHz/0.1V | -- | 20 | -- | pF |
| Operating Temperature | Derating when operating temperature up to 85°C. (see Fig. 2) | -40 | -- | 105 | °C |
| Storage Temperature | | -55 | -- | 125 | |
| Casing Temperature Rise | Ta=25°C | -- | 5 | -- | |
| Pin Welding Resistance Temperature | Welding spot is 1.5mm away from the casing, 10 seconds | -- | -- | 300 | |
| Storage Humidity | Non-condensing | -- | -- | 95 | %RH |
| Switching Frequency | 100% load, nominal input voltage | 50 | -- | 500 | KHz |
| MTBF | MIL-HDBK-217F@25°C | 3500 | -- | -- | K hours |

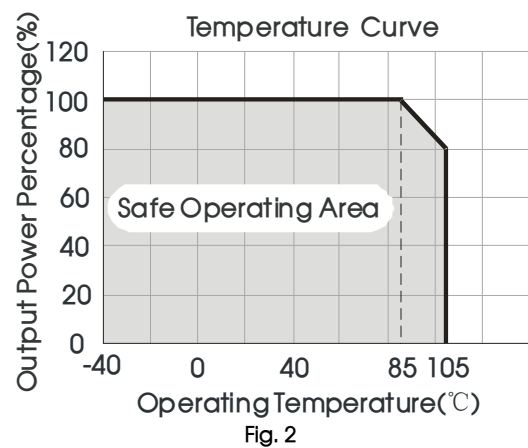
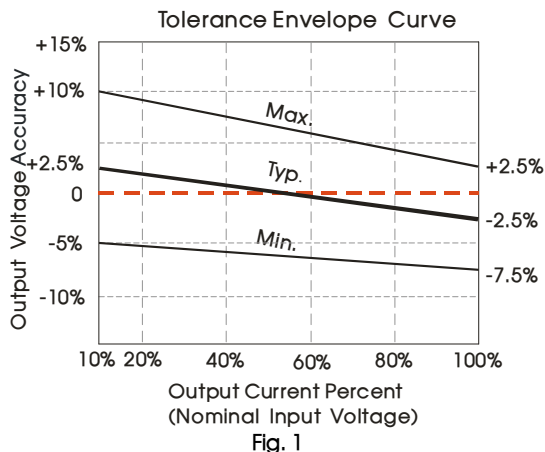
Physical Specifications

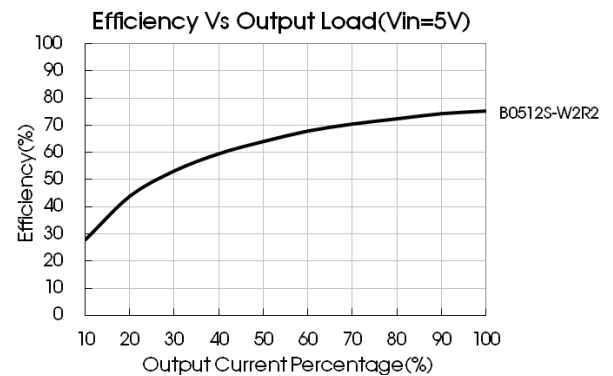
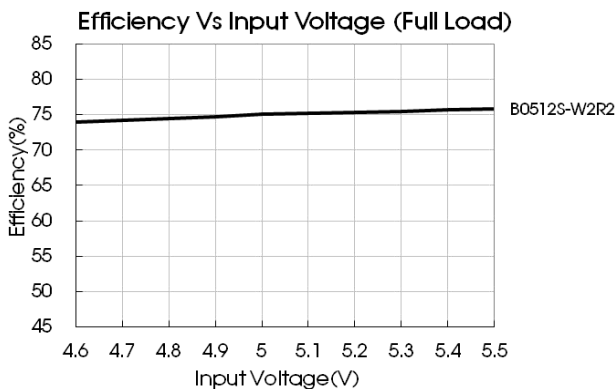
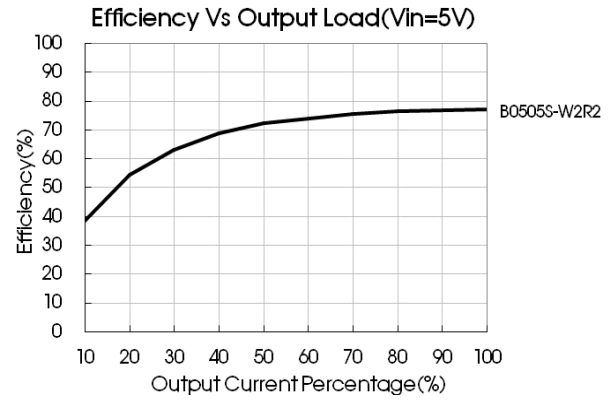
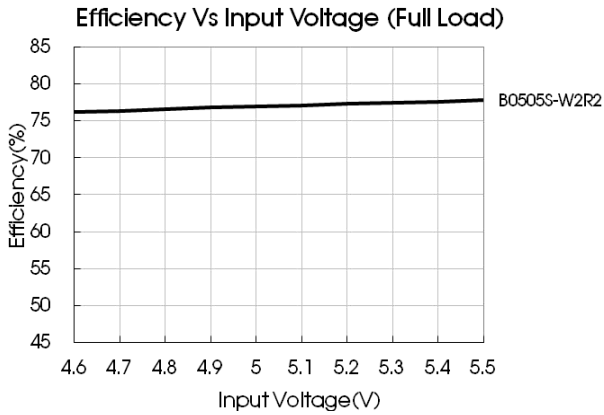
| | |
|-----------------|---|
| Casing Material | Black flame-retardant and heat-resistant plastic (UL94 V-0) |
| Dimensions | 11.60*6.00*10.16 mm |
| Weight | 1.2g(Typ.) |
| Cooling Method | Free air convection |

EMC Specifications

| | | | |
|-----|-----|-----------------|--|
| EMI | CE | CISPR32/EN55032 | CLASS B (see Fig. 4 for recommended circuit) |
| | RE | CISPR32/EN55032 | CLASS B (see Fig. 4 for recommended circuit) |
| EMS | ESD | IEC/EN61000-4-2 | Contact ±8KV perf. Criteria B |

Product Characteristic Curve

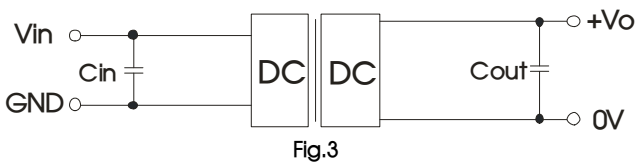




Design Reference

1. Typical application circuit

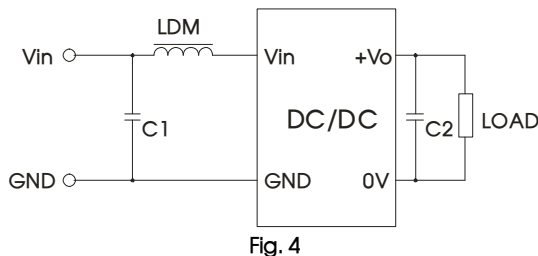
If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see Fig.3. Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in Table 1.



Recommended capacitive load value table (Table 1)

| Vin(VDC) | Cin(μF) | Vo (VDC) | Cout(μF) |
|----------|---------|----------|----------|
| 3.3/5 | 4.7 | 3.3/5 | 10 |
| 12/15 | 2.2 | 9 | 4.7 |
| 24 | 1 | 12 | 2.2 |

2. EMC typical recommended circuit (CLASS B)



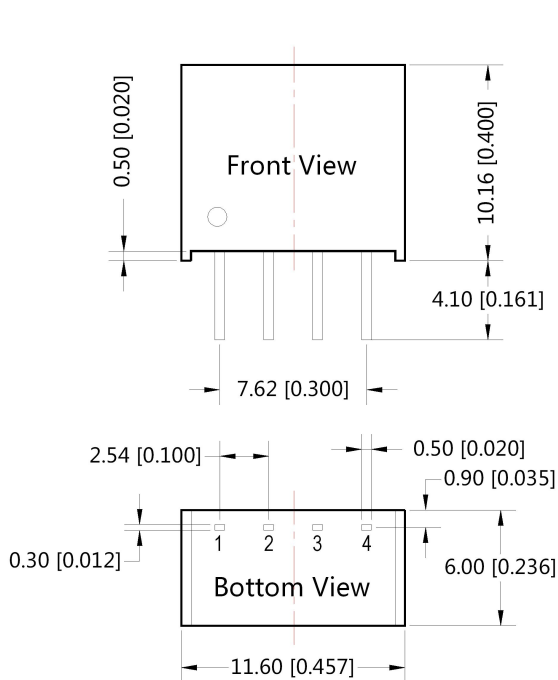
| Input voltage (VDC) | | 3.3/5/12/15/24 |
|---------------------|-----|----------------------------|
| EMI | C1 | 4.7μF /50V |
| | C2 | Refer to the Cout in Fig.3 |
| | LDM | 6.8μH |

3. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumption power is not less than 10%).

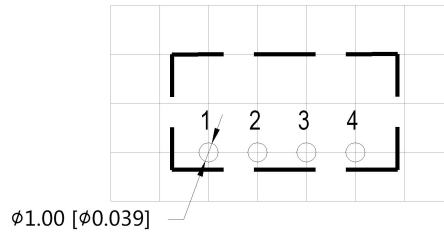
4. For more information please find DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:
Unit :mm[inch]
Pin section tolerances :±0.10[±0.004]
General tolerances:±0.25[±0.010]

THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm

| Pin-Out | |
|---------|----------|
| Pin | Function |
| 1 | GND |
| 2 | Vin |
| 3 | 0V |
| 4 | +Vo |

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58200003;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Specifications are subject to change without prior notice.

MORNSUN Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Luogang District, Guangzhou, P. R. China
Tel: 86-20-38601850-8801 Fax: 86-20-38601272 E-mail: info@mornsun.cn