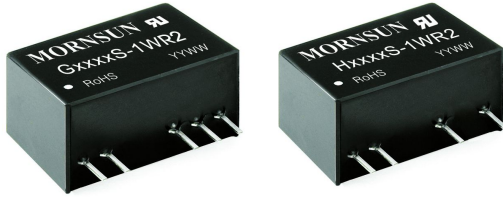


1W, Fixed input voltage , 4200VAC or 6000VDC isolated & unregulated positive-negative dual/single output

FEATURES

- SIP package
- High efficiency up to 81%
- Reinforced insulation
- The patient leakage current: Max 2μA
- Isolation voltage: 4200VAC or 6000VDC
- Operating temperature range:-40°C to +85°C
- Internal surface mounted design
- International standard pin-out
- EN60601-1, ANSI/AAMI ES60601-1 approval (1xMOPP/2xMOOP)
- IEC60950 approval



UL US CE CB Patent Protection RoHS



G_S-1WR2 & H_S-1WR2 series meet reinforced insulation requirements. They are specially designed for applications where require compact size, high isolation, low isolation capacitor and low leakage current power. They are widely used in medical, electricity, IGBT driver and so on. They are suitable for:

1. Where the voltage of the input power supply is stable (voltage variation: ±10%Vin);
 2. Where isolation is necessary between input and output (isolation voltage ≤4200VAC or 6000VDC);
 3. Where do not has high requirement of line regulation and the ripple & noise of the output voltage;
- Such as: Medical collection and isolation, High voltage collection circuit, IGBT-driven circuits, 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.) | | |
| -- | H0305S-1WR2 | 3.3 (2.97-3.63) | 5 | 200/20 | 67/71 | 1000 |
| UL/CE | G0505S-1WR2 | 5 (4.5-5.5) | ±5 | ±100/±10 | 74/78 | 470 |
| | G0509S-1WR2 | | ±9 | ±56/±6 | 76/80 | 470 |
| | G0512S-1WR2 | | ±12 | ±42/±5 | 70/74 | 220 |
| | G0515S-1WR2 | | ±15 | ±34/±4 | 72/76 | 220 |
| UL/CE/CB | H0503S-1WR2 | 5 (4.5-5.5) | 3.3 | 303/31 | 69/73 | 1000 |
| | H0505S-1WR2 | | 5 | 200/20 | 74/78 | 1000 |
| | H0512S-1WR2 | | 12 | 84/9 | 72/76 | 470 |
| | H0515S-1WR2 | | 15 | 67/7 | 72/76 | 470 |
| UL/CE | G1205S-1WR2 | 12 (10.8-13.2) | ±5 | ±100/±10 | 73/77 | 470 |
| | G1209S-1WR2 | | ±9 | ±56/±6 | 76/80 | 470 |
| | G1212S-1WR2 | | ±12 | ±42/±5 | 69/73 | 220 |
| | G1215S-1WR2 | | ±15 | ±34/±4 | 71/75 | 220 |
| UL/CE/CB | H1205S-1WR2 | 12 (10.8-13.2) | 5 | 200/20 | 73/77 | 1000 |
| | H1212S-1WR2 | | 12 | 84/9 | 77/81 | 470 |
| | H1215S-1WR2 | | 15 | 67/7 | 77/81 | 470 |
| -- | G1515S-1WR2 | 15 (13.5-16.5) | ±15 | ±34/±4 | 68/72 | 220 |
| UL/CE | G2405S-1WR2 | 24 (21.6-26.4) | ±5 | ±100/±10 | 71/75 | 470 |
| | G2409S-1WR2 | | ±9 | ±56/±6 | 75/79 | 470 |
| | G2412S-1WR2 | | ±12 | ±42/±5 | 72/76 | 220 |
| | G2415S-1WR2 | | ±15 | ±34/±4 | 72/76 | 220 |
| UL/CE/CB | H2405S-1WR2 | 24 (21.6-26.4) | 5 | 200/20 | 72/76 | 1000 |
| | H2412S-1WR2 | | 12 | 84/9 | 74/78 | 470 |
| | H2415S-1WR2 | | 15 | 67/7 | 74/78 | 470 |

Note:* The capacitive loads of positive and negative outputs are identical.

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|-----------------------------------|----------------------|------------------|--------|-------|------|
| Input Current (no-load/full load) | 3.3V input | -- | 45/426 | 70/-- | mA |
| | 5V input | -- | 35/274 | 60/-- | |
| | 12V input | -- | 15/114 | 40/-- | |
| | 15V input | -- | 18/93 | 40/-- | |
| | 24V input | -- | 10/56 | 25/-- | |
| Surge Voltage (1sec. max.) | 3.3V input | -0.7 | -- | 7 | VDC |
| | 5V input | -0.7 | -- | 9 | |
| | 12V input | -0.7 | -- | 18 | |
| | 15V input | -0.7 | -- | 21 | |
| | 24V input | -0.7 | -- | 30 | |
| Reflected Ripple Current* | | -- | 0.2 | -- | A |
| Input Filter | | Capacitor filter | | | |
| 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% | 3.3V output | -- | -- | ±1.5 | -- |
| | | Others | -- | -- | ±1.2 | |
| Load Regulation | 10%-100% load | 3.3V/5V output | -- | -- | 20 | % |
| | | Others | -- | -- | 15 | |
| Ripple & Noise* | 20MHz bandwidth | 3.3V output | -- | 80 | 150 | mVp-p |
| | | Others | -- | 70 | 120 | |
| Temperature Drift Coefficient | 100% full load | -- | ±0.02 | -- | %/°C | |
| Output Short Circuit Protection** | | -- | -- | 3 | s | |

Note: *Ripple and noise tested with "parallel cable" method, please see DC-DC Converter Application Notes for specific operation methods.
**Supply voltage must be discontinued at the end of short circuit duration which less than 3s.

General Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|------------------------------------|--|------|------|------|---------|
| Insulation Voltage | Input-output, with the test time of 1 minute | 4200 | -- | -- | VAC |
| | | 6000 | -- | -- | VDC |
| Patient Leakage Current | 250VAC, 50/60Hz | -- | -- | 2 | µA |
| Insulation Resistance | Input-output, isolation voltage 500VDC | 1000 | -- | -- | MΩ |
| Isolation Capacitance | Input-output, 100KHz/0.1V | -- | 5 | -- | pF |
| Operating Temperature | | -40 | -- | 85 | °C |
| Storage Temperature | | -55 | -- | 125 | |
| Casing Temperature Rise | Ta=25°C | -- | 25 | -- | |
| 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 | -- | 100 | -- | KHz |
| MTBF | MIL-HDBK-217F@25°C | 3500 | -- | -- | K hours |
| Transformer Creepage | | 5 | -- | -- | mm |
| Transformer Clearance | | 5 | -- | -- | |
| PCB Creepage & Clearance | | 5.5 | -- | -- | |

Note: 1. Patient leakage current and reinforced insulation is based on a 250 VAC, 50/60 Hz system input voltage.

2. The UL certification (ANSI/AAMI ES60601-1, File No. E347375) of G_S-1WR2 & H_S-1WR2 series is approved, G_S-1WR2 & H_S-1WR2 series meets 1xMOPP/2xMOOP when system input voltage is with 250VAC, 50/60Hz.

Physical Specifications

| | |
|--------------------|---|
| Casing Material | Black flame-retardant and heat-resistant plastic (UL94 V-0) |
| Package Dimensions | 19.50*9.80*12.50 mm |
| Weight | 4.2g(Typ.) |
| Cooling Method | Free air convection |

EMC Specifications

| | | |
|-----|-------------------------|--|
| EMI | Conducted emission | CISPR22/EN55022 CLASS B (see Fig. 5 for recommended circuit) |
| | Radiated emission | CISPR22/EN55022 CLASS B (see Fig. 5 for recommended circuit) |
| EMS | Electrostatic discharge | IEC/EN61000-4-2 Contact ±8KV perf. Criteria B |

Product Characteristic Curve

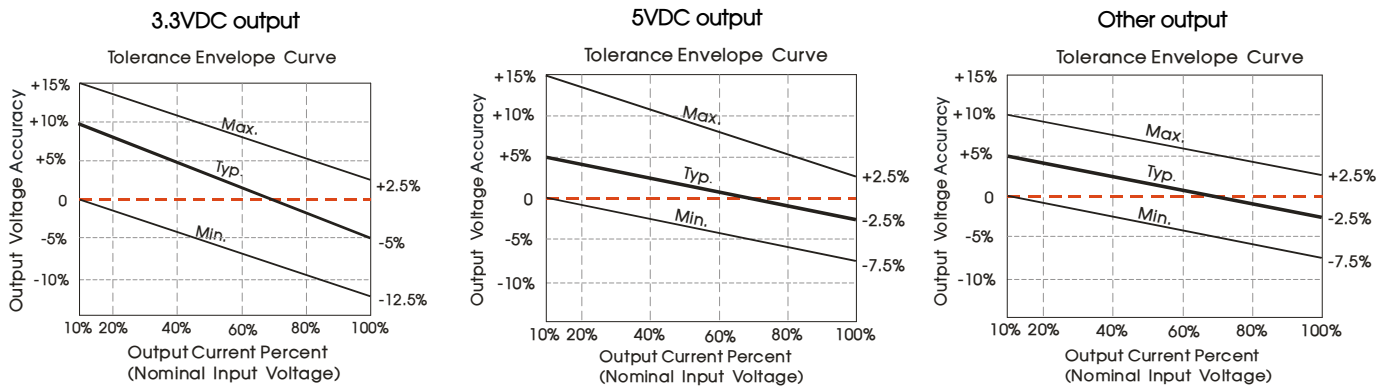


Fig. 1

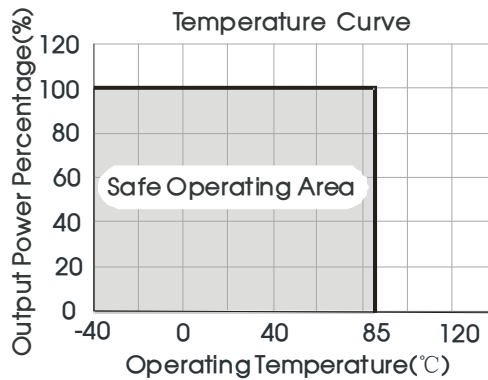
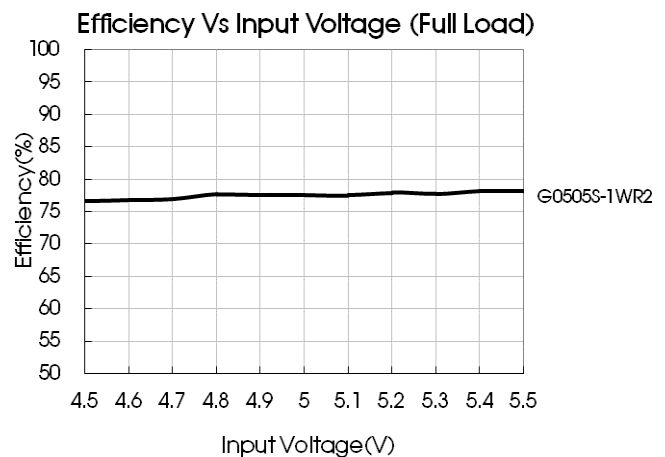
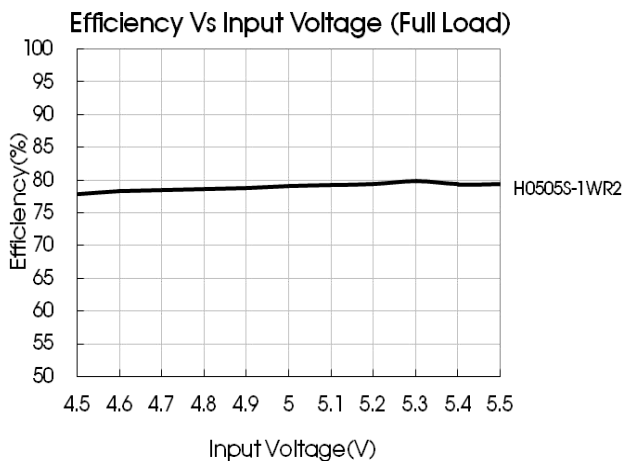
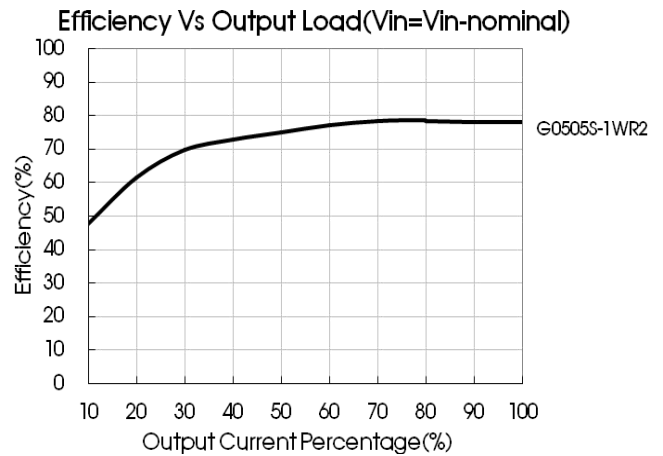
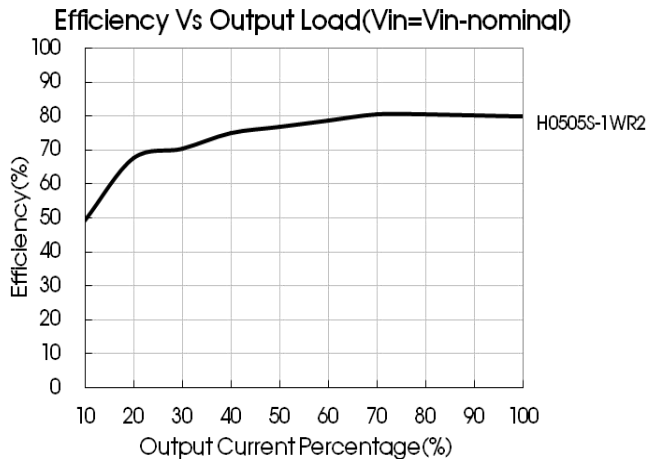


Fig. 2





Design Reference

1. Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.3. Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the modules running well, the recommended capacitive load values as shown in Table 1. The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (see Fig. 4).

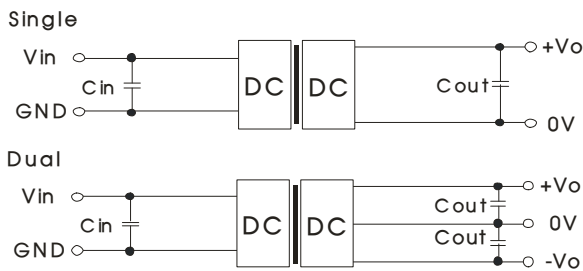


Fig. 3

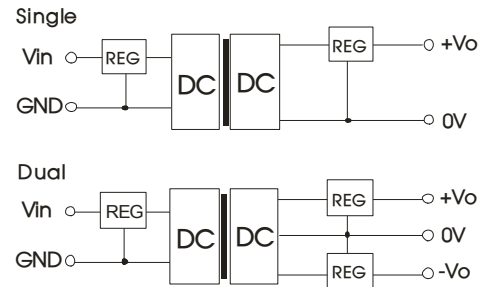


Fig. 4

Recommended capacitive load value table (Table 1)

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

2. EMC typical recommended circuit (CLASS B)

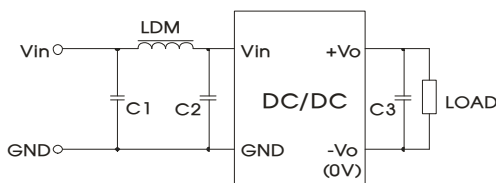


Fig. 5

Recommended typical circuit parameters:

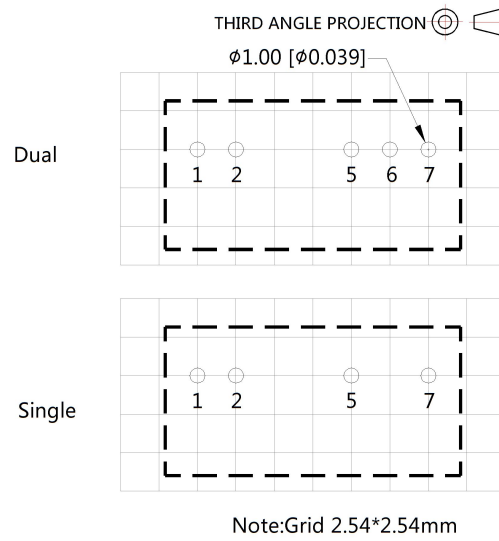
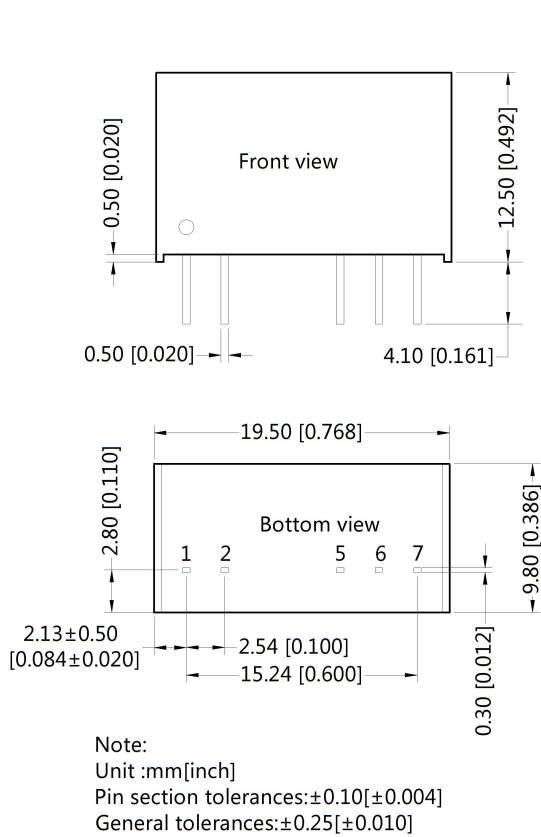
| | | |
|-----|-------------------|----------------------------|
| EMI | Input voltage (V) | 3.3/5/12/15/24 |
| | C1,C2 | 4.7μF /50V |
| | C3 | Refer to the Cout in Fig.3 |
| | LDM | 6.8μH |

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 the application notes on www.mornsun-power.com

Dimensions and Recommended Layout



| Pin-Out | | |
|---------|--------|------|
| Pin | Single | Dual |
| 1 | Vin | Vin |
| 2 | GND | GND |
| 5 | 0V | -Vo |
| 6 | No Pin | 0V |
| 7 | +Vo | +Vo |

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58200013;
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 Ta=25°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.

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