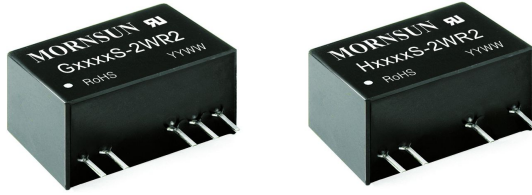


2W, Fixed input voltage, 4200VAC or 6000VDC isolated & unregulated positive-negative dual/single output

FEATURES

- SIP package
- High efficiency up to 84%
- Reinforced insulation
- The patient leakage current: Max 2μA
- Isolation voltage: 4200VAC or 6000VDC
- Operating temperature range: -40°C ~ +85°C
- Internal surface mounted design
- International standard pin-out
- Meets EN60601-1, ANSI/AAMI ES60601-1 standards (Pending)  
(1xMOPP/2xMOOP)



G\_S-2WR2 & H\_S-2WR2 series meet reinforced insulation requirements. It is specially designed for applications where require compact size, high isolation, low isolation capacitor and low leakage current power. It is widely used in medical, electricity, IGBT driver and so on. It is suitable for:

1. Where the voltage of the input power supply is stable (voltage variation:  $\pm 10\%V_{in}$ );
2. Where isolation is necessary between input and output (isolation voltage  $\leq 4200VAC$  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.) |                                     |                            |
| UL/CE<br>(Pending) | G0505S-2WR2 | 5                   | (4.5-5.5)   | ±5                  | ±200/±20                       | 74/78                               | 470                        |
|                    | G0509S-2WR2 |                     |             | ±9                  | ±111/±12                       | 74/78                               | 470                        |
|                    | G0512S-2WR2 |                     |             | ±12                 | ±83/±9                         | 74/78                               | 220                        |
|                    | G0515S-2WR2 |                     |             | ±15                 | ±67/±7                         | 76/80                               | 220                        |
|                    | H0505S-2WR2 |                     |             | 5                   | 400/40                         | 73/77                               | 1000                       |
|                    | H0512S-2WR2 |                     |             | 12                  | 167/17                         | 75/79                               | 470                        |
|                    | H0515S-2WR2 |                     |             | 15                  | 133/14                         | 75/79                               | 470                        |
|                    | G1205S-2WR2 | 12                  | (10.8-13.2) | ±5                  | ±200/±20                       | 74/78                               | 470                        |
|                    | G1209S-2WR2 |                     |             | ±9                  | ±111/±12                       | 78/82                               | 470                        |
|                    | G1212S-2WR2 |                     |             | ±12                 | ±83/±9                         | 78/82                               | 220                        |
|                    | G1215S-2WR2 |                     |             | ±15                 | ±67/±7                         | 76/80                               | 220                        |
|                    | H1205S-2WR2 |                     |             | 5                   | 400/40                         | 73/77                               | 1000                       |
|                    | H1212S-2WR2 |                     |             | 12                  | 167/17                         | 76/80                               | 470                        |
|                    | H1215S-2WR2 |                     |             | 15                  | 133/14                         | 78/82                               | 470                        |
|                    | G2405S-2WR2 | 24                  | (21.6-26.4) | ±5                  | ±200/±20                       | 75/79                               | 470                        |
|                    | G2409S-2WR2 |                     |             | ±9                  | ±111/±12                       | 77/81                               | 470                        |
|                    | G2412S-2WR2 |                     |             | ±12                 | ±83/±9                         | 78/82                               | 220                        |
|                    | G2415S-2WR2 |                     |             | ±15                 | ±67/±7                         | 77/81                               | 220                        |
|                    | H2405S-2WR2 |                     |             | 5                   | 400/40                         | 75/79                               | 1000                       |
|                    | H2412S-2WR2 |                     |             | 12                  | 167/17                         | 78/82                               | 470                        |
|                    | H2415S-2WR2 |                     |             | 15                  | 133/14                         | 80/84                               | 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) | 5V input             | --   | 35/520 | 80/-- | mA   |
|                                   | 12V input            | --   | 15/217 | 40/-- |      |
|                                   | 24V input            | --   | 10/106 | 25/-- |      |
| Surge Voltage (1sec. max.)        | 5V input             | -0.7 | --     | 9     | VDC  |
|                                   | 12V input            | -0.7 | --     | 18    |      |
|                                   | 24V input            | -0.7 | --     | 30    |      |
| Reflected Ripple Current          |                      | --   | 0.2    | --    | A    |
| Input Filter                      | Capacitor filter     |      |        |       |      |

### Output Specifications

| Item                              | Operating Conditions      | Min.                                  | Typ.  | Max. | Unit  |   |
|-----------------------------------|---------------------------|---------------------------------------|-------|------|-------|---|
| Output Voltage Accuracy           |                           | See tolerance envelope graph (Fig. 1) |       |      |       |   |
| Line Regulation                   | Input voltage change: ±1% | --                                    | --    | ±1.2 | --    |   |
| Load Regulation                   | 10%-100% load             | 5VDC output                           | --    | --   | 20    | % |
|                                   |                           | 9VDC output                           | --    | --   | 15    |   |
|                                   |                           | 12VDC output                          | --    | --   | 15    |   |
|                                   |                           | 15VDC output                          | --    | --   | 15    |   |
| Ripple & Noise*                   | 20MHz bandwidth           | --                                    | 100   | 150  | mVp-p |   |
| 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    |
|------------------------------------|--|------|------|------|---------|
| Isolation Voltage                  | Input-output, with the test time of 1 minute           | 4200 | --   | --   | VAC     |
|                                    |  | 6000 | --   | --   | VDC     |
| Patient Leakage Current            | 250VAC, 50/60Hz  | --   | --   | 2    | μA      |
| Isolation 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   | %       |
| Switching Frequency                | 100% load, nominal input voltage                       | --   | 100  | --   | KHz     |
| MTBF                               | MIL-HDFK-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-2WR2 & H\_S-2WR2 series is pending, G\_S-2WR2 & H\_S-2WR2 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

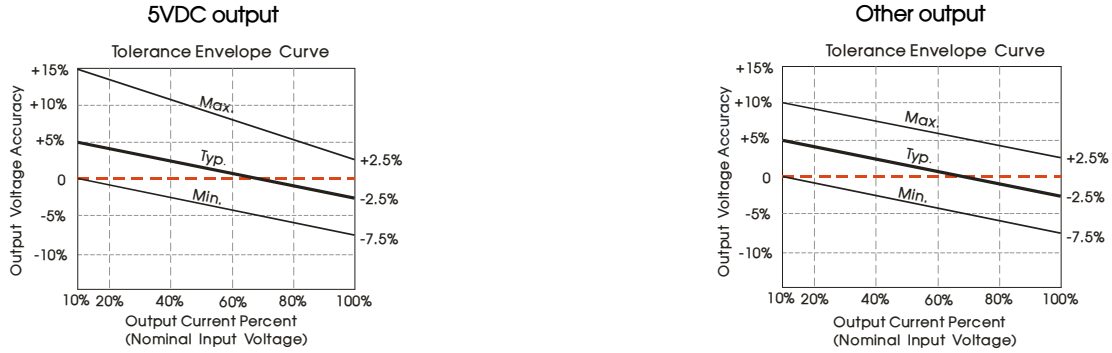


Fig. 1

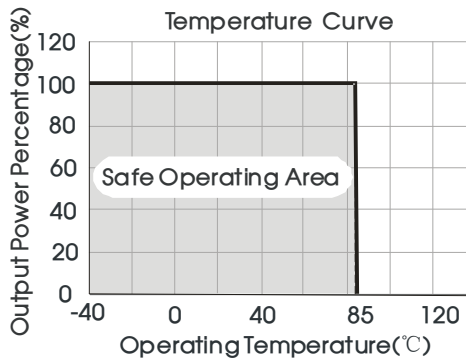
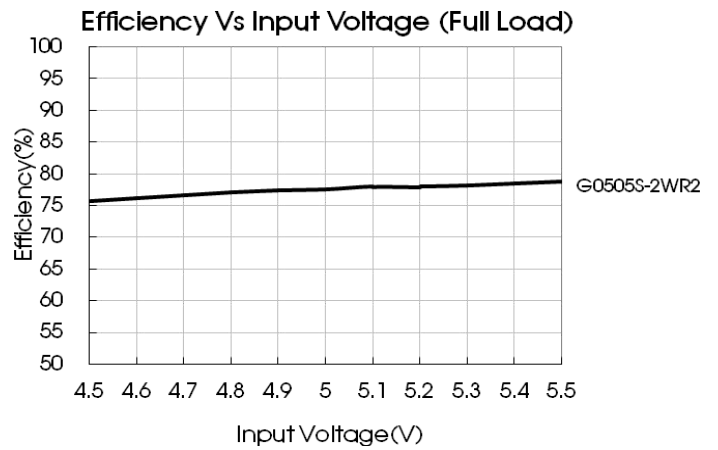
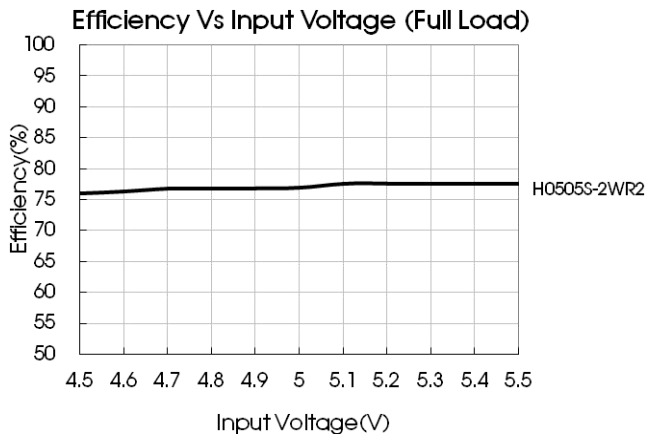
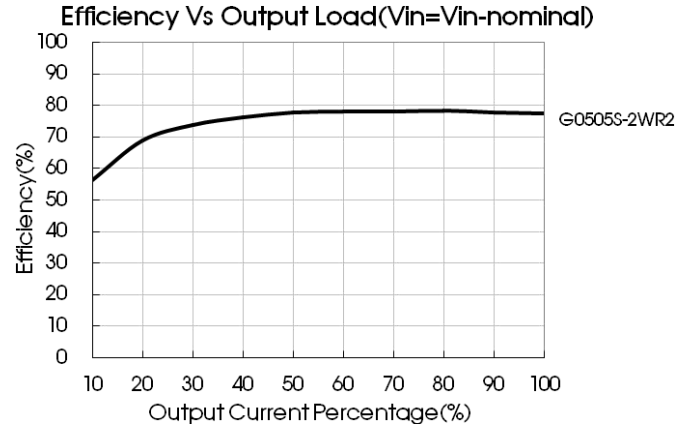
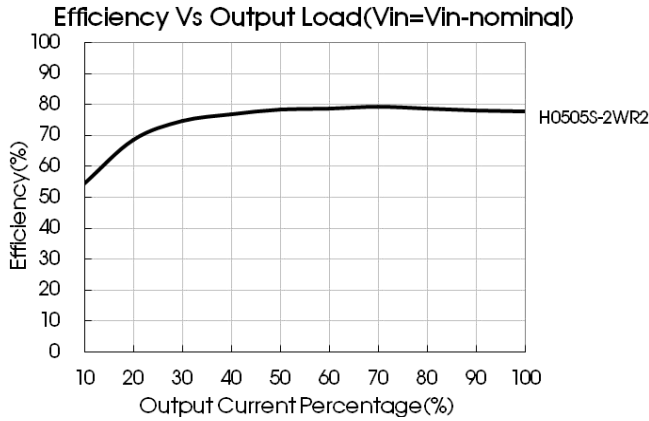


Fig. 2





**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).

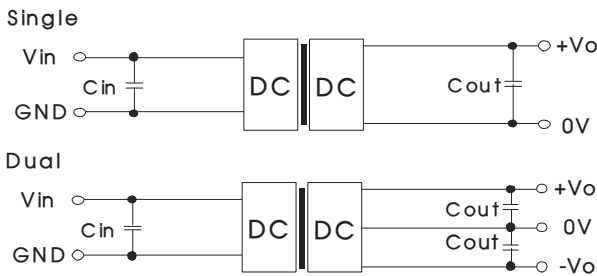


Fig. 3

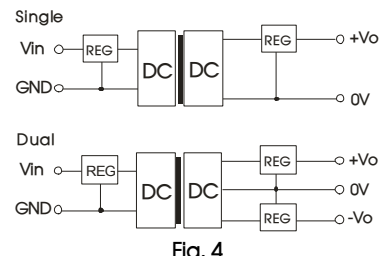


Fig. 4

Recommended capacitive load value table (Table 1)

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

**2. EMC typical recommended circuit (CLASS B)**

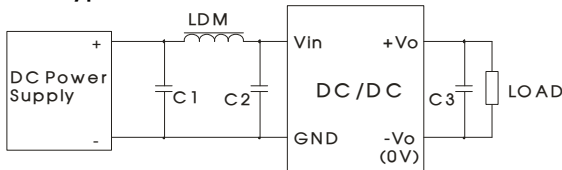


Fig. 5

Recommended typical circuit parameters:

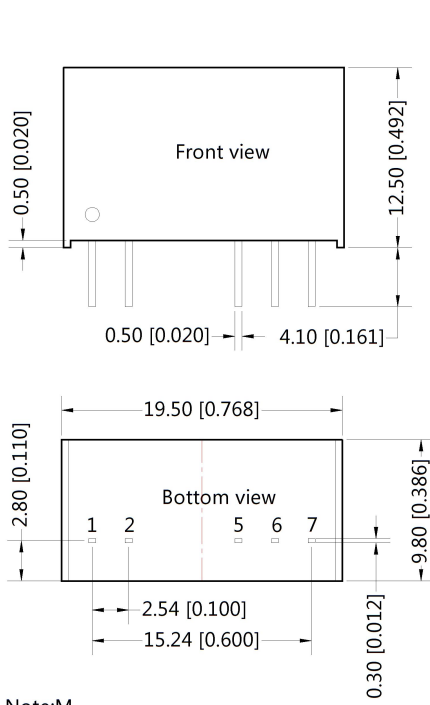
| Input voltage (V) |       | 5/12                       | 24   |
|-------------------|-------|----------------------------|------|
| EMI               | C1,C2 | 4.7μF /50V                 |      |
|                   | C3    | Refer to the Cout in Fig.3 |      |
|                   | LDM   | 6.8μH 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

**3. Output load requirements**

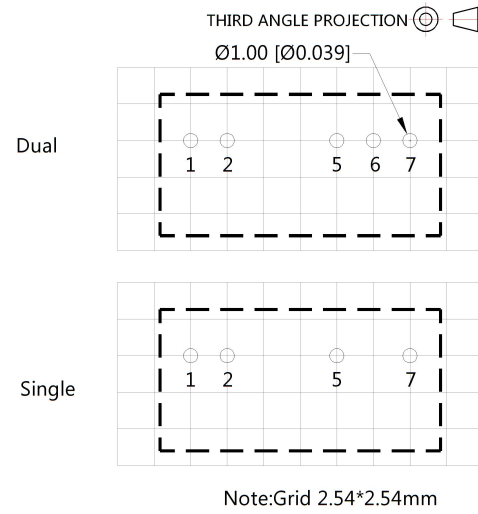
In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumer power is not less than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

4. For more information please find the application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



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



| 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'. Packing bag number: 58200013;
2. If the product is operated under the min. required load, the product performance cannot be guaranteed to comply with all performance indexes in this datasheet;
3. The max. capacitive load should be tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. We can provide product customization service, and please directly contact our technicians for specific information;
7. Specifications of this product are subject to changes without prior notice.

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