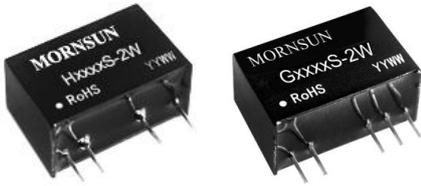


2W isolated DC-DC converter with 6000VDC
Fixed input voltage, unregulated positive-negative dual/single output



Patent Protection RoHS

FEATURES

- SIP package
- High efficiency up to 86%
- I/O isolation test voltage 6k VDC
- Operating ambient temperature range: -40°C to +105°C
- Continuous short-circuit protection
- Internal surface mounted design
- Industry standard pin-out

G_S-2W & H_S-2W series is specially designed for applications where an isolated voltage is required in a distributed power supply system. 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 $\leq 6000VDC$);
 3. Where do not has high requirement of line regulation and the ripple & noise of the output voltage;
- Such as: pure digital circuits, low frequency analog circuits, IGBT-driven circuits, etc.

Selection Guide

| Part No. | Input Voltage (VDC) | Output | | Full Load Efficiency (%) Min./Typ. | Capacitive Load*(μF) Max. | |
|-----------|---------------------|-------------------|---------------------------|---------------------------------------|-------------------------------------|-----|
| | Nominal(Range) | Voltage(VDC) | Current (mA) Max./Min. | | | |
| G0505S-2W | 5 (4.5-5.5) | ± 5 | $\pm 200/\pm 20$ | 72/76 | 100 | |
| G0509S-2W | | ± 9 | $\pm 111/\pm 12$ | 76/80 | | |
| G0512S-2W | | ± 12 | $\pm 83/\pm 9$ | 73/77 | | |
| G0515S-2W | | ± 15 | $\pm 67/\pm 7$ | 76/80 | | |
| G0524S-2W | | ± 24 | $\pm 42/\pm 4$ | 76/80 | | |
| H0503S-2W | | 3.3 | 500/50 | 70/74 | 220 | |
| H0505S-2W | | 5 | 400/40 | 72/76 | | |
| H0509S-2W | | 9 | 222/23 | 75/79 | | |
| H0512S-2W | | 12 | 167/17 | 77/81 | | |
| H0515S-2W | | 15 | 133/14 | 78/82 | | |
| G1205S-2W | 12 (10.8-13.2) | ± 5 | $\pm 200/\pm 20$ | 73/77 | 100 | |
| G1209S-2W | | ± 9 | $\pm 111/\pm 12$ | 77/81 | | |
| G1212S-2W | | ± 12 | $\pm 83/\pm 9$ | 75/79 | | |
| G1215S-2W | | ± 15 | $\pm 67/\pm 7$ | 78/82 | | |
| H1205S-2W | | 5 | 400/40 | 76/80 | | 220 |
| H1209S-2W | | 9 | 222/23 | 77/81 | | |
| H1212S-2W | | 12 | 167/17 | 79/83 | | |
| H1215S-2W | | 15 | 133/14 | 80/84 | | |
| G2405S-2W | | 24 (21.6-26.4) | ± 5 | $\pm 200/\pm 20$ | 76/80 | |
| G2412S-2W | | | ± 12 | $\pm 83/\pm 9$ | 77/81 | |
| G2415S-2W | ± 15 | | $\pm 67/\pm 7$ | 78/82 | | |
| H2405S-2W | 5 | | 400/40 | 76/80 | 220 | |
| H2409S-2W | 9 | | 222/23 | 77/81 | | |
| H2412S-2W | 12 | | 167/17 | 80/84 | | |
| H2415S-2W | 15 | | 133/14 | 81/85 | | |
| H2424S-2W | 24 | | 83/9 | 76/80 | | |

Note:* The specified maximum capacitive load for positive and negative output is identical.

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|-----------------------------------|----------------------|------|--------|------|------|
| Input Current (no-load/full load) | 5V input | -- | 40/500 | -- | mA |
| | 12V input | -- | 16/200 | -- | |
| | 24V input | -- | 9/100 | -- | |
| Surge Voltage (1sec. max.) | 5V input | -0.7 | -- | 9 | VDC |
| | 12V input | -0.7 | -- | 18 | |
| | 24V input | -0.7 | -- | 30 | |
| Input Filter | Capacitance filter | | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit | |
|--------------------------|------------------------------------|---------------|------|------------|-------|---|
| Voltage Accuracy | See output regulation curve(Fig.1) | | | | | |
| Linear Regulation | Input voltage change: $\pm 1\%$ | -- | -- | ± 1.2 | -- | |
| Load Regulation | 10%-100% load | 3.3VDC output | -- | -- | 20 | % |
| | | 5VDC output | -- | -- | 15 | |
| | | 9VDC output | -- | -- | 15 | |
| | | 12VDC output | -- | -- | 15 | |
| | | 15VDC output | -- | -- | 15 | |
| | | 24VDC output | -- | -- | 15 | |
| Ripple & Noise* | 20MHz bandwidth | -- | 150 | 250 | mVp-p | |
| Temperature Coefficient | 100% full load | -- | -- | ± 0.03 | %/°C | |
| Short-circuit Protection | Continuous, self-recovery | | | | | |

Notes: 1.*Unbalanced load of positive-negative dual output module: $\pm 5\%$.

2.*The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.

General Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------------|---|---------------|------|------|------------|
| Isolation | Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max. | 6000 | -- | -- | VDC |
| Insulation Resistance | Input-output resistance at 500VDC | 1000 | -- | -- | M Ω |
| Isolation Capacitance | Input-output capacitance at 100kHz/0.1V | -- | 5 | -- | pF |
| Operating Temperature | Derating when operating temperature up to 85°C (see Fig. 2) | -40 | -- | 105 | °C |
| Storage Temperature | | -55 | -- | 125 | |
| Case Temperature Rise | Ta=25°C | -- | 25 | -- | |
| Pin Soldering Resistance Temperature | Soldering spot is 1.5mm away from case for 10 seconds | -- | -- | 300 | |
| Storage Humidity | Non-condensing | -- | -- | 95 | % |
| Switching Frequency | 100% load, nominal input voltage | 5V input | -- | 60 | KHz |
| | | 12V/24V input | -- | 80 | |
| MTBF | MIL-HDBK-217F@25°C | 3500 | -- | -- | K hours |

Mechanical Specifications

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

Electromagnetic Compatibility (EMC)

| | | |
|-----------|-----|--|
| Emissions | CE | CISPR32/EN55032 CLASS B (see Fig. 5 for recommended circuit) |
| | RE | CISPR32/EN55032 CLASS B (see Fig. 5 for recommended circuit) |
| EMS | ESD | IEC/EN61000-4-2 Contact ± 6 KV perf. Criteria B |

Typical Characteristic Curves

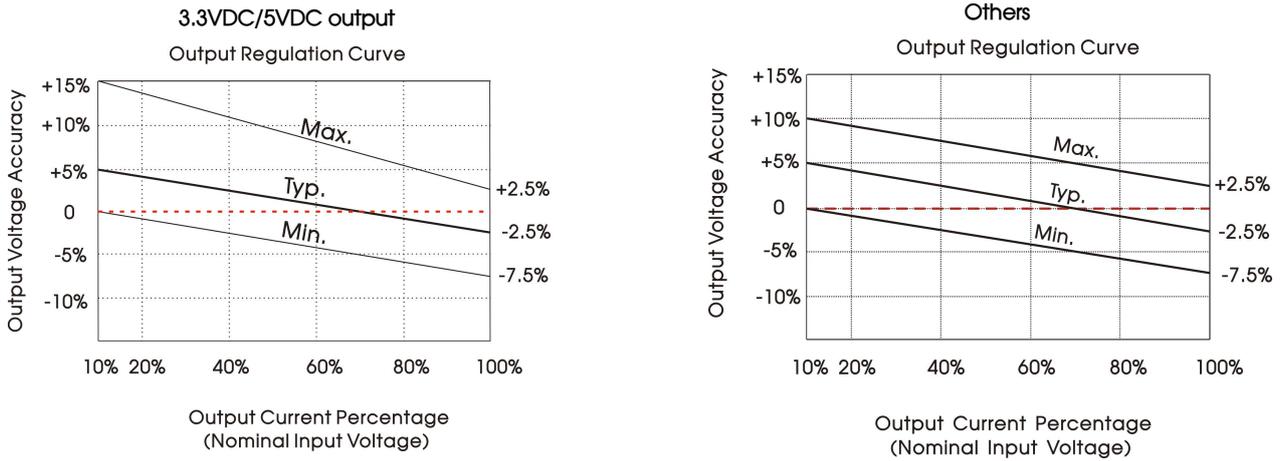


Fig. 1

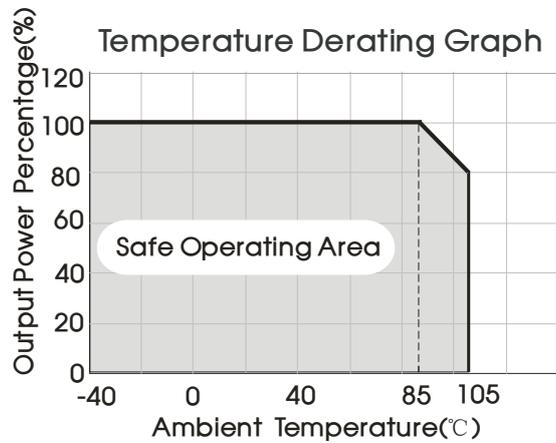
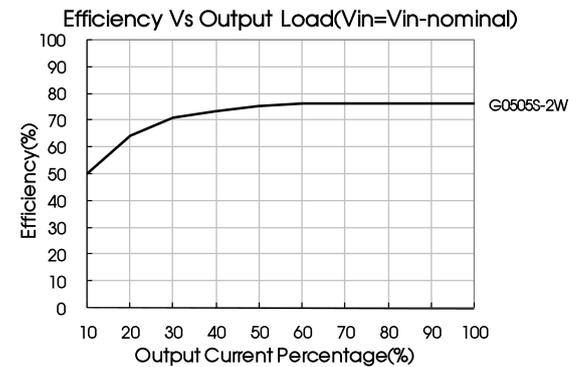
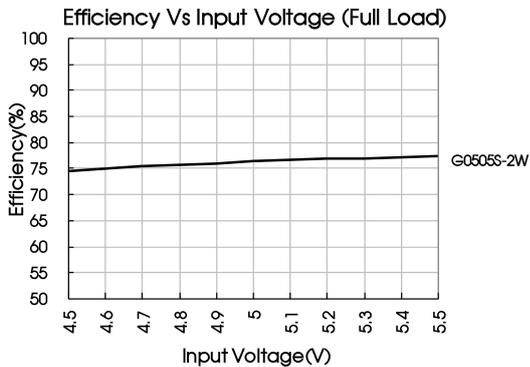
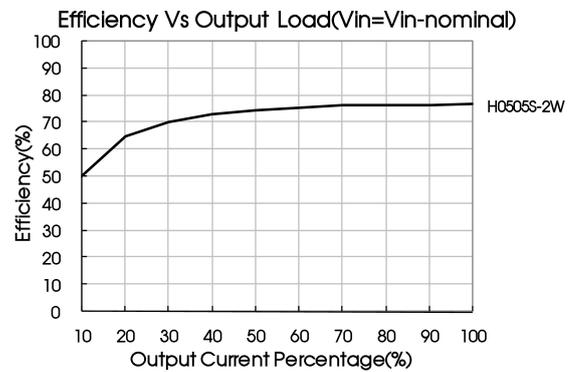
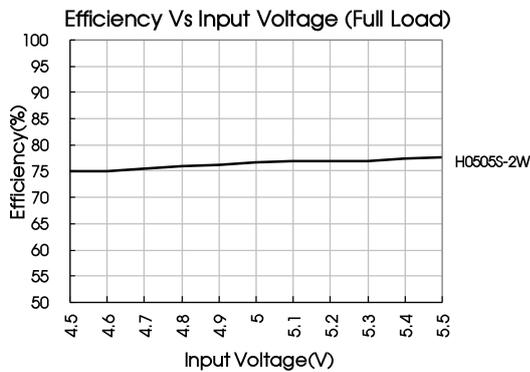


Fig. 2

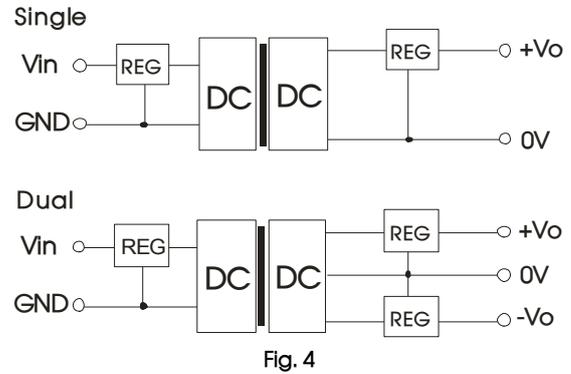
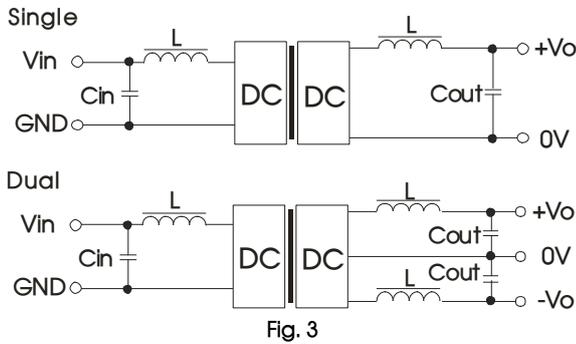


1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.2.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to 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).

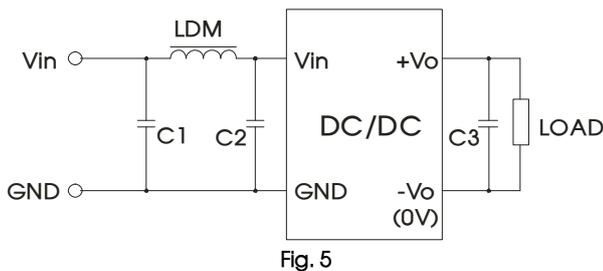


Recommended capacitive load value table (Table 1)

| Vin (VDC) | Cin (μF) | Single Vout (VDC) | Cout (μF) | Dual Vout (VDC) | Cout (μF) |
|-----------|----------|-------------------|-----------|-----------------|-----------|
| 5 | 10 | 3.3/5 | 10 | ±5 | 4.7 |
| 12 | 4.7 | 9 | 4.7 | ±9 | 2.2 |
| 24 | 2.2 | 12 | 2.2 | ±12 | 1 |
| — | — | 15 | 1 | ±15/±24 | 0.47 |

It is not recommended to connect any external capacitor when output power is less than 0.5W.

2. EMC (CLASS B) compliance circuit



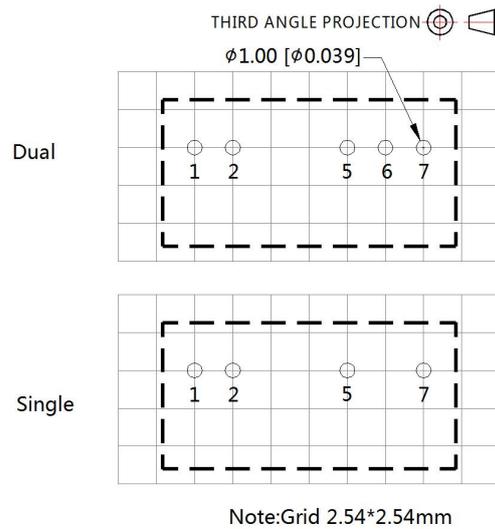
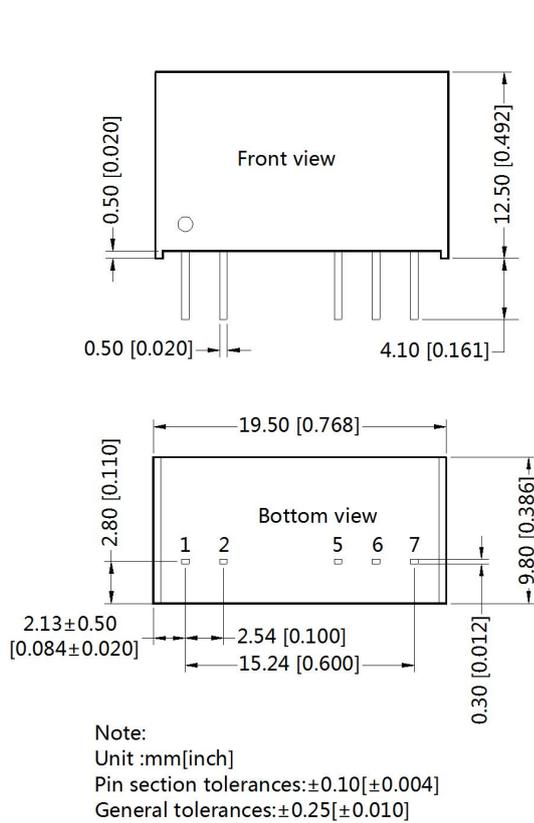
Recommended typical circuit parameters:

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

3. Output load requirements

For a reliable and efficient operation of the converter, the minimum load should never be less than 10% of the rated output load. If the total required output power is below 10%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained at 10% minimum.

4. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com.



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

Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58200013;
- 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;
- The max. capacitive load should be tested within the input voltage range and under full load conditions;
- 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;
- All index testing methods in this datasheet are based on our company corporate standards;
- The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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