

1W isolated DC-DC converter
Fixed input voltage and unregulated single output



Patent Protection RoHS

FEATURES

- Continuous short-circuit protection
- Operating ambient temperature range: -40°C ~ +105°C
- High efficiency up to 80%
- Compact SIP package
- Industry standard pin-out
- I/O isolation test voltage 1.5k VDC
- The production process meets IATF16949 requirement.

The CB0505S-1WR2 is designed for application where isolated output is required from a distributed power system. It can be used in automobile motor control and drive system. Such as motor vehicle communication system controller, engine control system, the ignition system, the motor voltage monitoring, the electronic accelerator pedal, automobile tire pressure detection system, doors and tail lights controller, air conditioning control and battery management system (BMS), etc.

Selection Guide

| Certification | Part No. | Input Voltage (VDC) | Output | | Full Load Efficiency (%) Min./Typ. | Capacitive Load (μF) Max. |
|---------------|--------------|---------------------|---------------|--------------------------|---------------------------------------|------------------------------|
| | | Nominal (Range) | Voltage (VDC) | Current(mA) Max./Min. | | |
| -- | CB0505S-1WR2 | 5 (4.5-5.5) | 5 | 200/20 | 76/80 | 220 |

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|-----------------------|--------------------|--------|--------|------|
| Input Current (full load / no-load) | nominal input voltage | -- | 250/20 | 263/60 | mA |
| Reflected Ripple Current | nominal input voltage | -- | 15 | -- | mA |
| Surge Voltage (1sec. max.) | | -0.7 | -- | 9 | VDC |
| Input Filter | | Capacitance filter | | | |
| Hot Plug | | Unavailable | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|--------------------------|---------------------------|-------------------------------------|------|-------|-------|
| Voltage Accuracy | | See output regulation curve(Fig. 1) | | | |
| Linear Regulation | Input voltage change: ±1% | -- | -- | ±1.2 | -- |
| Load Regulation | 10%-100% load | -- | 12 | -- | % |
| Ripple & Noise* | 20MHz bandwidth | -- | 60 | 150 | mVp-p |
| Temperature Coefficient | Full load | -- | -- | ±0.03 | %/°C |
| Short-circuit Protection | | Continuous, self-recovery | | | |

Note: * 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. | 1500 | -- | -- | VDC |
| Insulation Resistance | Input-output resistance at 500VDC | 1000 | -- | -- | MΩ |
| Isolation Capacitance | Input-output capacitance at 100kHz/0.1V | -- | 20 | -- | pF |
| Operating Temperature | Derating when operating temperature ≥ 85°C, (see Fig. 2) | -40 | -- | 105 | °C |
| Storage Temperature | | -55 | -- | 125 | |
| Case Temperature Rise | Ta=25°C, nominal input, full load output | -- | 25 | -- | |
| Pin Soldering Resistance Temperature | Soldering spot is 1.5mm away from case for 10 seconds | -- | -- | 300 | °C |

| | | | | | |
|---------------------|----------------------------------|------|-----|----|---------|
| Storage Humidity | Non-condensing | -- | -- | 95 | %RH |
| Switching Frequency | Full load, nominal input voltage | -- | 100 | -- | KHz |
| MTBF | MIL-HDBK-217F@25°C | 3500 | -- | -- | K hours |

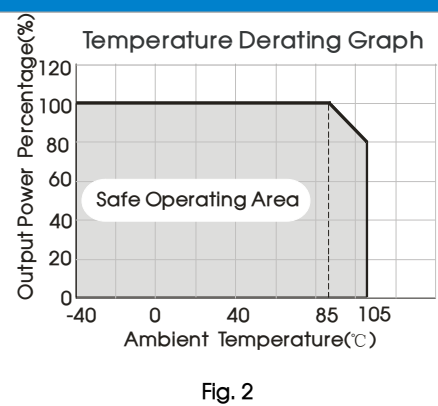
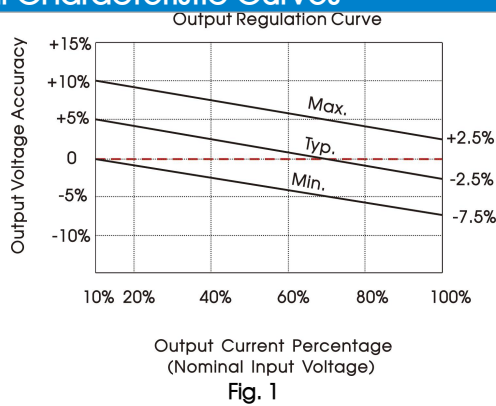
Mechanical Specifications

| | |
|-----------------|--|
| Case Material | Black plastic; flame-retardant and heat-resistant (UL94 V-0) |
| Dimensions | 11.60 x 6.00 x 10.16 mm |
| Weight | 1.3g(Typ.) |
| Cooling Methods | Free air convection |

Electromagnetic Compatibility (EMC)

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

Typical Characteristic Curves

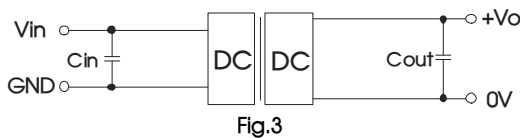


Design Reference

1. Typical application circuit

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. 3.

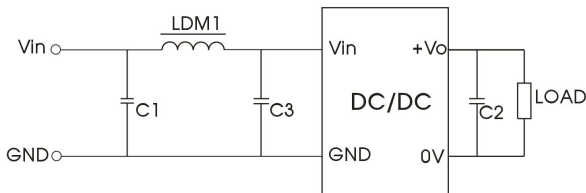
Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.



Recommended capacitive load value table (Table 1)

| Vin(VDC) | Cin(μF) | Vo (VDC) | Cout(μF) |
|----------|---------|----------|----------|
| 5 | 4.7 | 5 | 10 |

2. EMC (CLASS B) compliance circuit



| Input voltage (VDC) | | 5 |
|---------------------|------|----------------------------|
| Emissions | C1 | 4.7μF /50V |
| | C2 | Refer to the Cout in Fig.3 |
| | C3 | 2.2μF /25V |
| | LDM1 | 6.8μH |

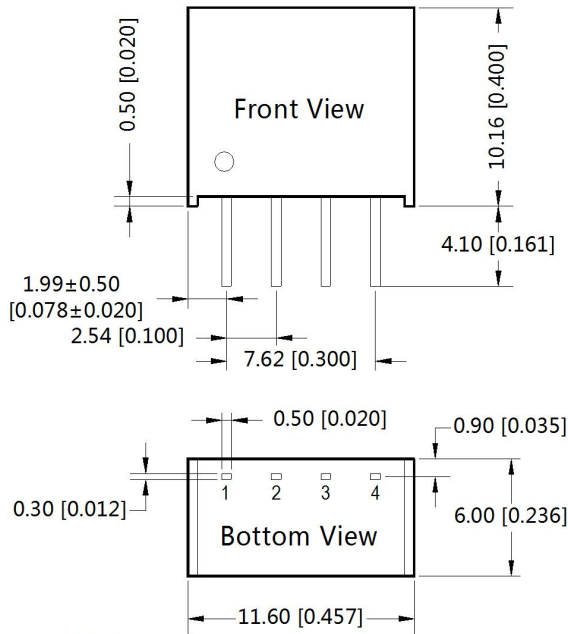
3. Output load requirements

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%).

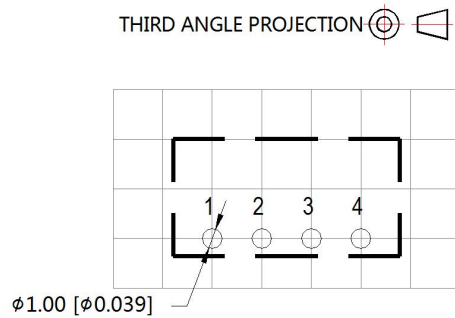
4. For additional information please refer to DC-DC converter application notes on

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]



Note : Grid 2.54*2.54mm

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

Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number 58200003;
- 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;
- The maximum capacitive load offered were tested at input voltage range and full load;
- 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;
- 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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