

Non-isolated DC-DC converter  
1.8W Fixed input voltage and dual regulated output



## FEATURES

- Ultra-small size: 46.00 x 25.70 x 15.50mm
- ±3000 VDC dual independent adjustable output
- High output voltage stability, low-time drift, low-temperature drift
- Operating ambient temperature range: -40°C to +85°C
- Output short circuit and over-current protection
- EMI meets CISPR32/EN55032 CLASS B
- Electrical safety distances comply with IPC standards

Patent Protection

RoHS



HO1-PN302V-0.3C offers output power 1.8W, it features with operating ambient temperature range -40°C to +85°C, output short circuit protection, over-current protection, ultra-small size packaging, ±3000 VDC dual independent adjustable output, high output voltage stability, low time drift, temperature drift, low ripple, which are specifically designed for applications in board power systems where high voltages are required and output ripple requirements are high and output voltage stability is critical. Products are widely applicable: ion mobility spectrum, mass spectrum, light spectrum, electron beam, ion beam and other high pressure applications.

## Selection Guide

| Certification | Part No.        | Input Voltage (VDC) | Input Current <sup>①</sup> (mA)<br>Full load/No-load |         | Output Voltage (VDC) |            |                                | Current (mA)<br>Max./Min. |
|---------------|-----------------|---------------------|--|---------|----------------------|------------|--------------------------------|---------------------------|
|               |                 | Nominal (Range)     | Typ.   | Max.    | Nominal <sup>②</sup> | Range      | Guaranteed range               |                           |
| --            | HO1-PN302V-0.3C | 12<br>(10.8-13.2)   | 340/80   | 360/110 | ±3000                | 0 to ±3000 | +300 to +3000<br>-300 to -3000 | 0.3/0                     |

Note:

① At the nominal input voltage and nominal output voltage;

② When the Vadj control voltage is equal to 5VDC (Typ.), The relationship curve between output voltage and control voltage is shown in Fig.3.

## Input Specifications

| Item                       | Operating Conditions | Min.        | Typ. | Max. | Unit |
|----------------------------|----------------------|-------------|------|------|------|
| Surge Voltage (1sec. max.) |                      | --          | --   | 18   | VDC  |
| Input Filter Type          |                      | PI filter   |      |      |      |
| Hot Plug                   |                      | Unavailable |      |      |      |

## Output Specifications

| Item                        | Operating Conditions   | Min.   | Typ.   | Max.   | Unit  |
|-----------------------------|--|--|--------|--------|-------|
| Adjust-point Tolerance      | Output voltage guaranteed range, see Fig.3   | --   | ±1     | ±2     | %     |
| Reference Voltage accuracy  | 0% -100% load, reference 5.15V output  | --   | ±1     | ±2     |       |
| Linear Regulation           | Input voltage range, nominal output voltage, full load                                     | --   | ±0.05  | ±0.1   |       |
| Load Regulation             | Nominal input voltage, nominal output voltage, 10%-100% load                               | --   | ±0.05  | ±0.1   |       |
| Time Coefficient            | Nominal input voltage, nominal output voltage, full load, after warming up for 30 minutes  | --   | ±0.003 | ±0.005 | %/Hr  |
| Temperature Coefficient     | Nominal input voltage, nominal output voltage, full load                                   | --   | ±0.003 | ±0.05  | %/°C  |
| Ripple & Noise <sup>①</sup> | 20MHz bandwidth, nominal input voltage, 0%-100% load                                       | --   | 300    | 400    | mVp-p |
|                             | 20MHz bandwidth, nominal input voltage<br>0%-100% load<br>External RC filter ( see Fig.2 ) | --   | 50     | 100    |       |
| Over-current Protection     | Input voltage range  | 110  | 130    | 150    | %Io   |
| Short-circuit Protection    |  | Constant current mode, continuous, self-recovery |        |        |       |

Note:

① Ripple & Noise test method see Fig.4.

General Specifications

| Item                                 | Operating Conditions                                  | Min.                                   | Typ. | Max. | Unit    |
|--------------------------------------|---|--|------|------|---------|
| Operating Temperature                | See Fig.1   | -40                                    | --   | +85  | °C      |
| Storage Temperature                  |   | -40                                    | --   | +85  |         |
| Storage Humidity                     | Non-condensing  | 5                                      | --   | 85   | %RH     |
| Pin Soldering Resistance Temperature | Soldering spot is 1.5mm away from case for 10 seconds | --                                     | --   | 300  | °C      |
| Vibration                            |   | 10-150Hz, 5G, 0.75mm. along X, Y and Z |      |      |         |
| Switching Frequency                  | Nominal input voltage, full load                      | --                                     | 83   | --   | kHz     |
| MTBF                                 | MIL-HDBK-217F@25°C                                    | 1000                                   | --   | --   | k hours |

Mechanical Specifications

|                  |  |
|------------------|--|
| Housing Material | Black flame retardant heat-resistant plastic(UL94 V-0) |
| Dimensions       | 46.00 x 25.70 x 15.50mm                                |
| Weight           | 31g (Typ.)   |
| Cooling Method   | Free air convection                                    |

Electromagnetic Compatibility (EMC)

|           |       |   |   |                  |
|-----------|-------|---|---|------------------|
| Emissions | CE    | CISPR32/EN55032 CLASS B (see Fig.5-① for recommended circuit) |   |                  |
|           | RE    | CISPR32/EN55032 CLASS B (Without extra components)            |   |                  |
| Immunity  | ESD   | IEC/EN61000-4-2   | Contact ±4kV  | perf. Criteria B |
|           | RS    | IEC/EN61000-4-3   | 10V/m   | perf. Criteria B |
|           | EFT   | IEC/EN61000-4-4   | 100kHz ±2kV (see Fig.5-② for recommended circuit)       | perf. Criteria B |
|           | Surge | IEC/EN61000-4-5   | line to line ±2kV (see Fig.5-② for recommended circuit) | perf. Criteria B |
|           | CS    | IEC/EN61000-4-6   | 3 Vr.m.s  | perf. Criteria B |

Product Characteristic Curve

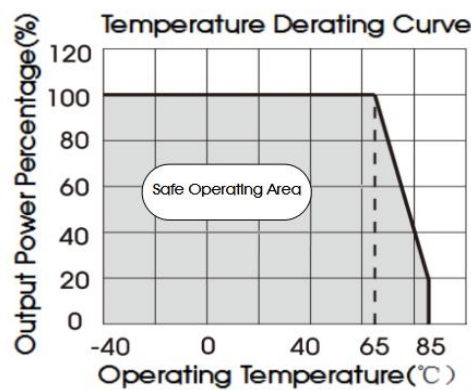


Fig.1

Design Reference

1. Typical application

This series are tested according to the test circuit recommended in Fig.4 before leaving the factory.

To further reduce the output ripple as required, an external RC filter can be connected to the output as shown in Fig.2

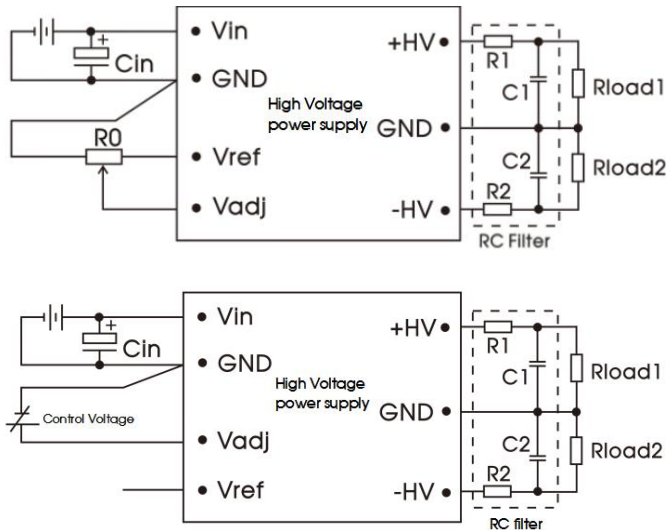
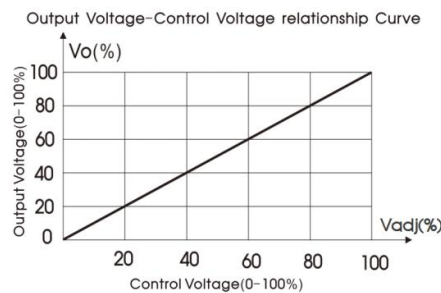


Fig.2

Parameter description:

|       |  |
|-------|--|
| Cin   | 100μF/25V Aluminium electrolytic capacitor |
| R1/R2 | 2kΩ  |
| C1/C2 | 15nF/4000V                                 |
| R0    | Adjustable resistance ≥10kΩ                |



(Note: 100% Vadj is equal to 5VDC (Typ.))

Fig. 3 The relationship curve of output voltage and control voltage

2. Ripple and noise test recommended circuit

Parameter description:

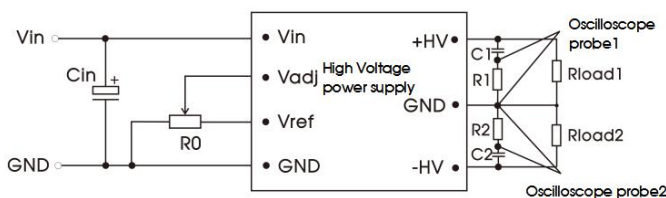


Fig.4 Ripple and noise test recommended circuit

|       |  |
|-------|--|
| Cin   | 100μF/25V Aluminium electrolytic capacitor |
| R1/R2 | 1kΩ/2W resistance                          |
| C1/C2 | 472K/250VAC Y2 capacitance                 |
| R0    | Adjustable resistance ≥10kΩ                |

3. EMC compliance circuit

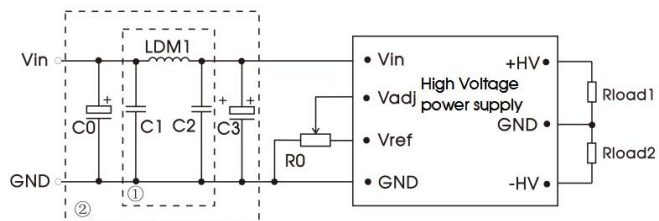


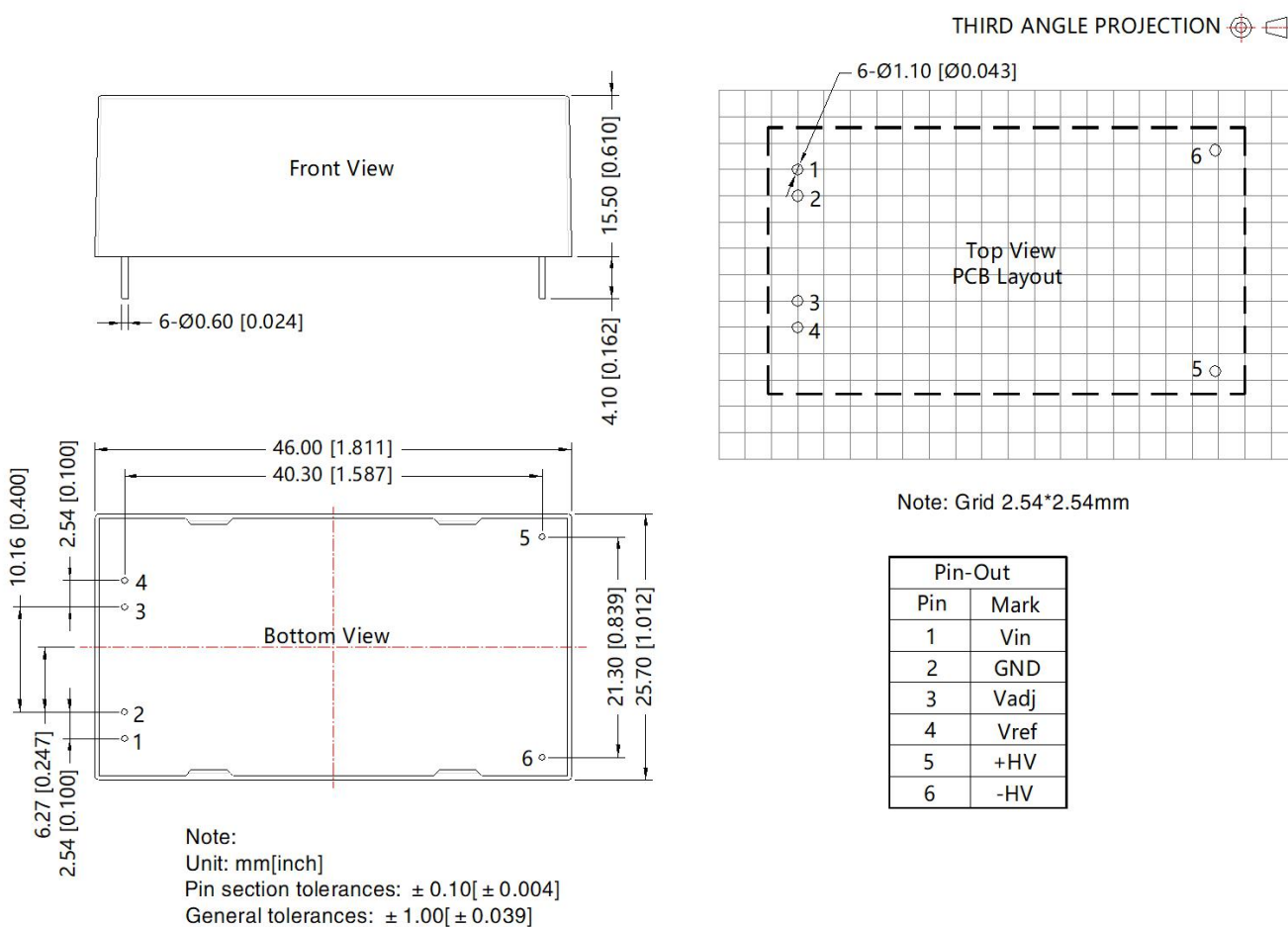
Fig.5

Parameter description:

|       |  |
|-------|--|
| C0/C3 | 680μF/25V Aluminium electrolytic capacitor |
| C1/C2 | 22μF/25V                                   |
| LDM1  | 12μH                                       |
| R0    | Adjustable resistance $\geq 10k\Omega$     |

4. For additional information please refer to DC-DC converter application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



Notes:

1. For additional information please refer to Product Packaging Information. Packaging bag number: 58220011;
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. 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;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. 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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