

150W isolated DC-DC converter with ultra-wide, ultra-high 250 -1500VDC input for Renewable Energy



FEATURES

- Input voltage up to 1700VDC (Transient, duration: 10s)
- Ultra-wide input voltage range of 250 - 1500VDC
- Industrial grade operating temperature -40°C to +85°C
- High I/O isolation voltage up to 4000VAC
- High efficiency, low ripple & noise
- High reliability, long lifespan
- Input under-voltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage protection
- Operating up to 5000m altitude

PV150-29BxxL series is a regulated DC-DC converter with an ultra-wide and ultra-high DC input of 250-1500VDC, which design based on standard of EN62109, UL1741, CSA-C22.2 No.107.1. The products feature high efficiency, high reliability, high insulation and a high level of safety protection. It is widely used in renewable energy industries, such as photovoltaic inverter, energy storage systems, charging pile, industrial control. The converters provide multiple protection features and guarantee stable and safe operating environments even under abnormal working conditions.

Selection Guide

| Certification | Part No.* | Output Power(W) | Nominal Output Voltage and Current (Vo/Io) | Efficiency at 800VDC(%) Typ. | Capacitive Load (μF) Max. |
|---------------|--------------|-----------------|--|------------------------------|---------------------------|
| / | PV150-29B24L | 150 | 24V/6250mA | 90 | 2000 |
| | PV150-29B28L | | 28V/5360mA | 90 | 1500 |
| | PV150-29B32L | | 32V/4690mA | 91 | 1500 |

Note: *PV150-29BxxL input-output lead wire length is 11cm, PV150-29BxxL-22 input-output lead wire length is 22.5cm, PV150-29BxxL-50 input lead wire length is 22.5cm, output lead wire length is 52.5cm, the rest of the performance is the same.

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------|----------------------------|----------------------|------|------|------|
| Input Voltage Range | | 250 | -- | 1500 | VDC |
| Input Current | 250VDC | -- | -- | 0.8 | A |
| | 800VDC | -- | -- | 0.4 | |
| Inrush Current | 800VDC | -- | -- | 100 | |
| | 1500VDC | -- | -- | 200 | |
| Input Under-voltage Protection | Lockout activation range | 150 | -- | 220 | VDC |
| | Lockout deactivation range | 180 | -- | 250 | |
| External Input Fuse | | 4A/1500VDC, required | | | |
| Hot Plug | | Unavailable | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|--------------------------|--------------------------------------|-----------------------------------|--------------------------------|-------|------|
| Output Voltage Accuracy | All load range | -- | ±1 | ±2 | % |
| Line Regulation | Rated load | -- | ±0.1 | ±0.25 | |
| Load Regulation | 0% - 100% load | -- | ±0.5 | ±1 | |
| Ripple & Noise* | 20MHz bandwidth (peak-to-peak value) | -- | -- | 300 | mV |
| Temperature Coefficient | | -- | ±0.02 | -- | %/°C |
| Short Circuit Protection | | Hiccup, continuous, self-recovery | | | |
| Over-current Protection | | ≥110%Io, hiccup, self-recovery | | | |
| Over-voltage Protection | 24V output | ≤32VDC | Output voltage clamp or hiccup | | |
| | 28V output | ≤35VDC | | | |
| | 32V output | ≤45VDC | | | |
| Minimum Load | | 0 | -- | -- | % |

| | | | | | | |
|---------------------|-----------------------------|---------------|----|----|----|----|
| Hold-up Time | Room temperature, full load | 800VDC input | -- | 10 | -- | ms |
| | | 1500VDC input | -- | 30 | -- | |
| Start-up Delay Time | Room temperature | -- | -- | 3 | | s |

Note: * The "Tip and barrel method" is used for ripple and noise test, please refer to PV Converter Application Notes for specific information.

General Specifications

| Item | | Operating Conditions | Min. | Typ. | Max. | Unit |
|-----------------------|-------------------|--|--|------|------|---------|
| Isolation | Input - output | Electric Strength Test for 1min., leakage current <5mA | 4000 | -- | -- | VAC |
| | Output - PE | | 4000 | -- | -- | |
| | Input - PE | | 3000 | -- | -- | |
| | Input - PE | Electric Strength Test for 1min., leakage current <10mA | 4000 | -- | -- | |
| Insulation Resistance | Input - output | 500VDC | 500 | -- | -- | MΩ |
| Operating Temperature | | | -40 | -- | +85 | °C |
| Storage Temperature | | | -40 | -- | +85 | |
| Storage Humidity | | | -- | -- | 95 | %RH |
| Power Derating | -40°C to -25°C | | 3.33 | -- | -- | % / °C |
| | +55°C to +85°C | | 2.33 | -- | -- | |
| | 250VDC - 300VDC | | 0.8 | -- | -- | % / VDC |
| | 1400VDC - 1500VDC | | 0.2 | -- | -- | |
| | 2000m - 5000m | | 6.67 | -- | -- | % / Km |
| Switching Frequency | | | -- | 65 | -- | kHz |
| Safety Standard | | | Design refer to UL1741, CSA-C22.2 No.107.1 & EN62109-1 | | | |
| MTBF | | MIL-HDBK-217F@25°C | ≥ 300,000 h | | | |

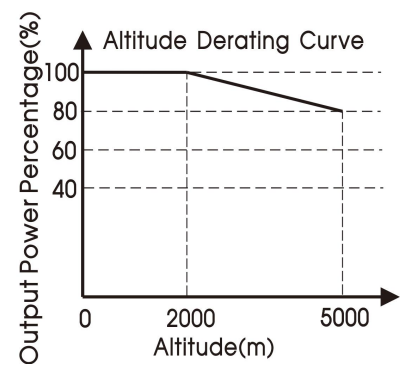
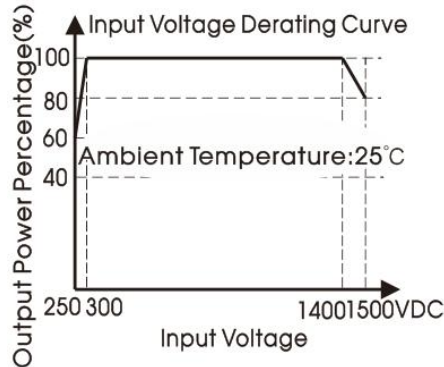
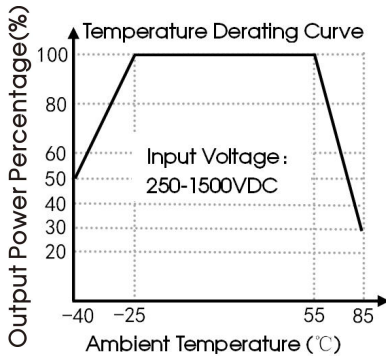
Mechanical Specifications

| | |
|----------------|--------------------------|
| Case Material | Metal |
| Dimensions | 201.00 x 70.00 x 42.00mm |
| Weight | 550g (Typ.) |
| Cooling Method | Free air convection |

Electromagnetic Compatibility (EMC)

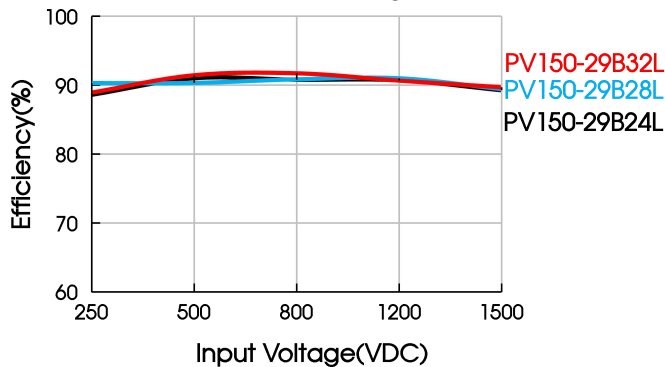
| | | | | |
|-----------|-------|-----------------|--|------------------|
| Emissions | CE | CISPR32/EN55032 | CLASS A | |
| | RE | CISPR32/EN55032 | CLASS A | |
| Immunity | ESD | IEC/EN61000-4-2 | Contact ±6KV/Air ±8KV | Perf. Criteria A |
| | RS | IEC/EN61000-4-3 | 10V/m | Perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | ±4KV | Perf. Criteria A |
| | Surge | IEC/EN61000-4-5 | Line to line ±1KV/ line to ground ±2KV | Perf. Criteria B |
| | CS | IEC/EN61000-4-6 | 10Vr.m.s | Perf. Criteria A |

Product Characteristic Curve

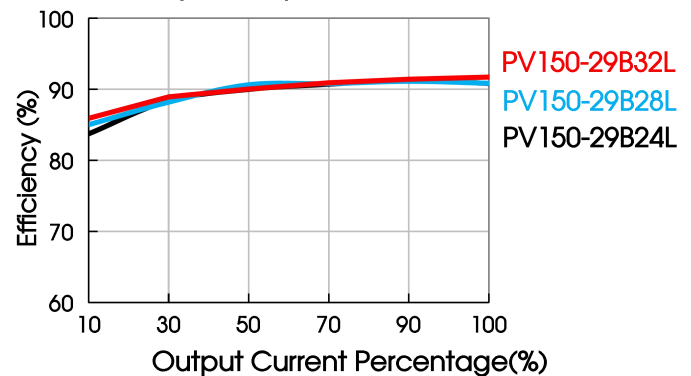


Note: ① With an input between 250 - 300VDC/1400 - 1500VDC, the output power of PV150-29BxxL parts must be derated as per temperature derating curves;
② This product is suitable for applications using natural free air convection; for applications in closed environment please consult Mornsun FAE.

Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=800VDC)



Design Reference

1. Typical application circuit

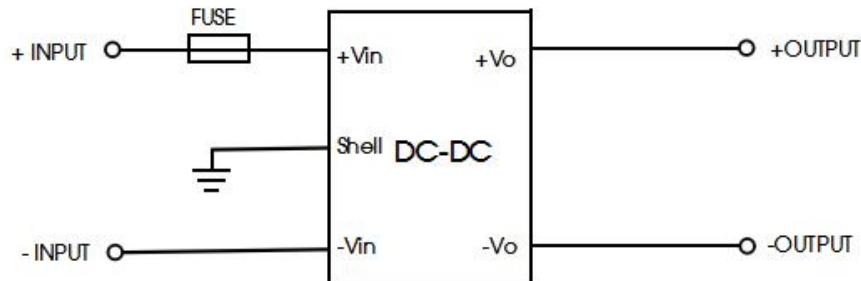
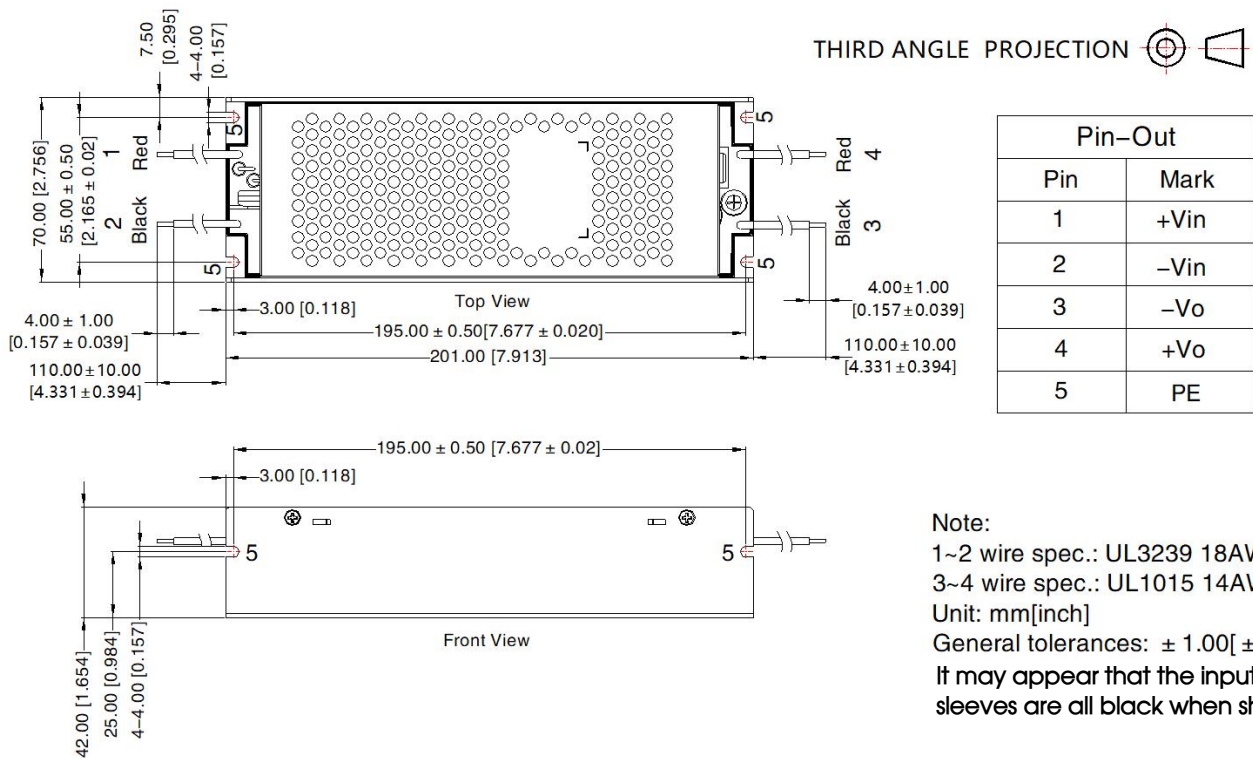


Fig. 1

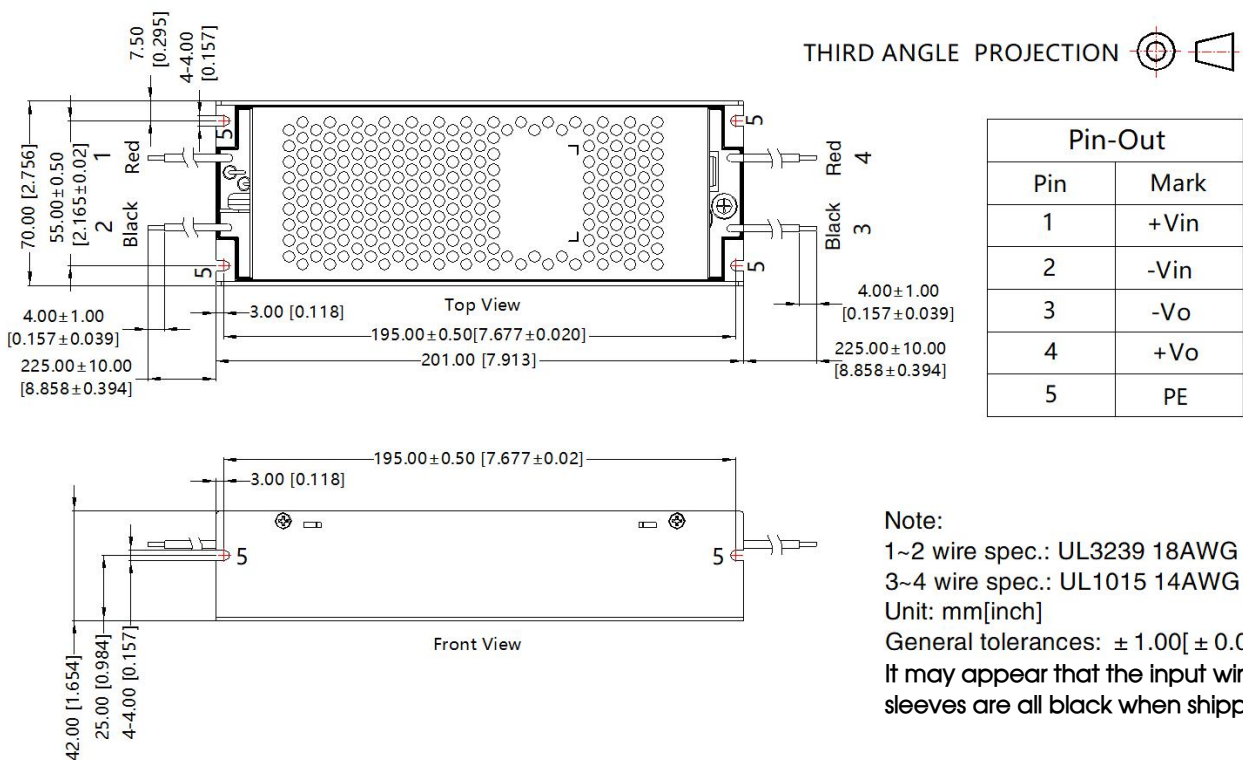
| Model | Recommended value |
|-------|----------------------|
| FUSE | 4A/1500VDC, required |

2. For more information Please find the application notes on www.mornsun-power.com.

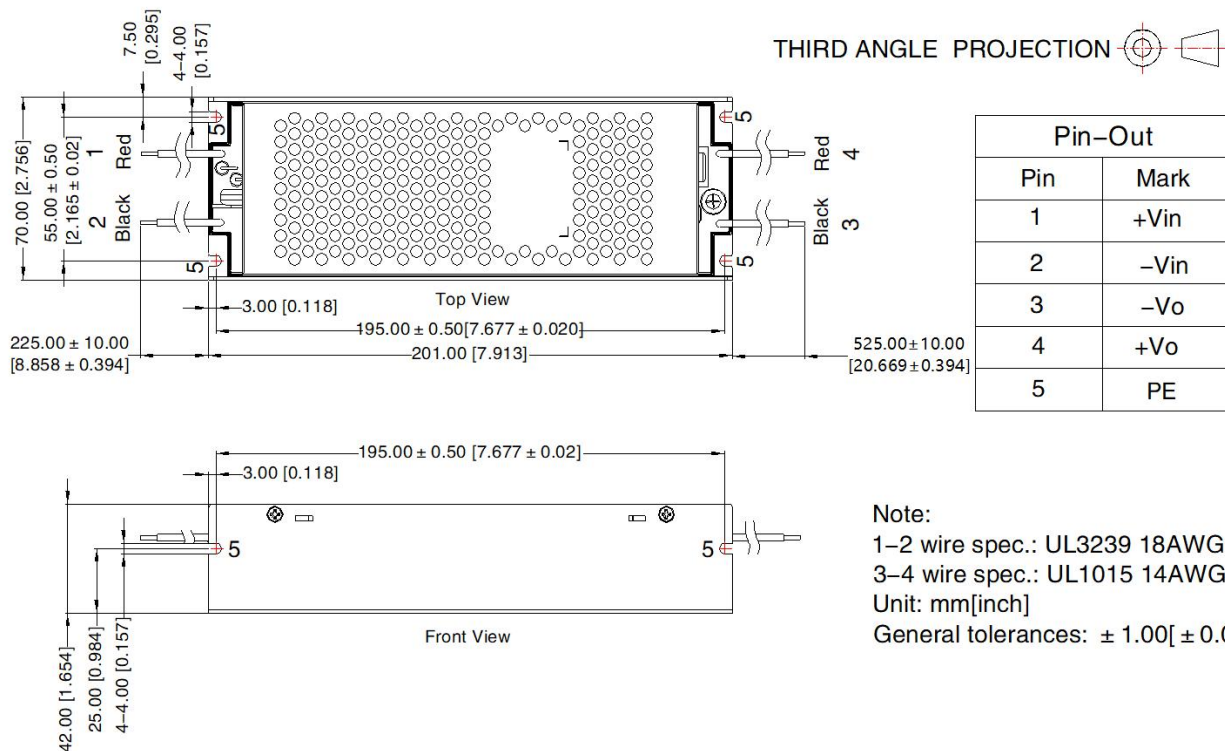
Dimensions and Recommended Layout (PV150-29BxxL)



Dimensions and Recommended Layout (PV150-29BxxL-22)



Dimensions and Recommended Layout (PV150-29BxxL-50)



- WARNING:**
1. WARNING: REPLACE ONLY WITH THE SAME RATINGS AND TYPE OF FUSE.
 2. WARNING: SHOCK HAZARD. HORIZONTAL PACKAGE ONLY FOR MOUNTING IN A RACK OR ENCLOSURE FULLY ENCLOSING ALL LIVE PARTS.
 3. DANGER — HIGH VOLTAGE.

- AVERTISSEMENT:**
1. AVERTISSEMENT : N'UTILISER QUE DES FUSIBLES DE MÊME CALIBRE ET DE MÊME TYPE QUE LE FUSIBLE D'ORIGINE.
 2. AVERTISSEMENT: PAQUET HORIZONTAL RISQUE D'ÉLECTROCUTION. UNIQUEMENT POUR LE MONTAGE DANS UN RACK OU UN ENCEINTE ENFERMANT ENTièrement TOUTES LES PIÈCES SOUS TENSION.
 3. DANGER : HAUTE TENSION.

- Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220211;
 2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% with nominal input voltage and rated output load;
 3. All index testing methods in this datasheet are based on our company corporate standards;
 4. We can provide product customization service, please contact our technicians directly for specific information;
 5. Products are related to laws and regulations: see "Features" and "EMC";
 6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
 7. When the photovoltaic array is exposed to light, it supplies a d.c. voltage to the PCE;
 8. External fuse is UL or VDE certificate that specification is 4A of 1500VDC used in end system.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com