

New energy 300 - 1500VDC over wide and over high input voltage isolation converter



FEATURES

- Ultra wide input voltage range: 300 - 1500VDC
- 4000VAC high isolation voltage
- Industrial grade operating temperature: -40°C to +70°C
- High efficiency, Low ripple & noise
- High reliability, Long lifespan
- Input Under-voltage Protection, Reverse input voltage protection, output short circuit, over-current, over-voltage protection
- Meets UL1741, CSA-C22.2 No.107.1, EN62109 standards (Pending)
- Meets 5000m altitude requirements

PV200-29Bxx series — 300-1500VDC ultra wide input voltage regulated DC-DC converter, which have advantages such as high efficiency, high reliability and high safety isolation. The series products are widely used in industries such as photovoltaic power generation, stored energy and high voltage frequency conversion, provide a stable operating voltage for the load device, Its multiple protection features can enhance the safety performance of the module power supply and the load under abnormal working conditions.

Selection Guide

| Certification | Part No. | Output Power | Nominal Output Voltage and Current(Vo/Io) | Efficiency (850VDC, %/Typ.) | Max. Capacitive Load(μF) |
|---------------------|-------------|--------------|---|-----------------------------|--------------------------|
| UL/CSA/CE (Pending) | PV200-29B24 | 200W | 24V/8.4A | 86 | 5000 |
| | PV200-29B48 | | 48V/4.2A | 87 | 2000 |

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------|----------------------------------|------------------------|------|------|------|
| Input Voltage Range | | 300 | -- | 1500 | VDC |
| Input current | 300VDC | -- | -- | 1200 | mA |
| | 850VDC | -- | -- | 450 | |
| | 1500VDC | -- | -- | 200 | |
| Inrush current | 850VDC | -- | 150 | -- | A |
| | 1500VDC | -- | 250 | -- | |
| Input under-voltage protection | Under-voltage protection begins | 265 | -- | 285 | VDC |
| | Under-voltage protection release | 275 | -- | 295 | |
| External input fuse | | 15A/1500VDC, necessary | | | |
| Hot Plug | | Unavailable | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit | |
|-------------------------------|-----------------------------------|-------------------------------------|-------|------|------|----|
| Output Voltage Accuracy | 0% - 100% load | -- | -- | ±2 | % | |
| Line Regulation | Full load | -- | -- | ±1 | | |
| Load Regulation | 0% - 100% load | -- | -- | ±1 | | |
| Ripple & Noise* | 20MHz bandwidth (peak-peak value) | -- | 200 | 300 | mV | |
| Temperature Drift Coefficient | | -- | ±0.02 | -- | %/°C | |
| Short Circuit Protection | | Hiccup, Continuous, self-recovery | | | | |
| Over-current Protection | | 110 - 300%Io, hiccup, self-recovery | | | | |
| Over-voltage Protection | 24V output | ≤35VDC or hiccup protection | | | | |
| | 48V output | ≤60VDC or hiccup protection | | | | |
| Min. Load | | 0 | -- | -- | % | |
| Hold-up Time | Room temperature, Full load | 850VDC input | 5 | -- | -- | ms |
| | | 1500VDC input | 8 | -- | -- | |
| Start delay time** | 300-1500VDC | -- | 3 | -- | s | |

Note: * Ripple and noise are measured by "parallel cable" method, please see "Ultra-wide High Input Voltage PV Power Supply Application Guide".

**Start-up delay time Test conditions:full voltage input range,full output load range(product input power-down to the input voltage re-power-on cooler time is greater than 15s.)

General Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|-----------------------|----------------------|---|---|------|------|--------|
| Isolation Voltage | Input - output | Test time: 1min, Leakage current $\leq 10\text{mA}$ | 4000 | -- | -- | VAC |
| | Input - PE | Test time: 1min, Leakage current $\leq 5\text{mA}$ | 2000 | -- | -- | |
| | Output - PE | | 2000 | -- | -- | |
| Operating Temperature | | | -40 | -- | +70 | °C |
| Storage Temperature | | | -40 | -- | +85 | |
| Storage Humidity | | | -- | -- | 95 | %RH |
| Power Derating | -40°C to -25°C | | 3.33 | -- | -- | % / °C |
| | +55°C to +70°C | | 3.33 | -- | -- | |
| | 1400 - 1500VDC | | 0.20 | -- | -- | |
| Switching Frequency | | | -- | 65 | -- | kHz |
| Safety Standard | | | UL1741, CSA-C22.2 No.107.1, EN62109 | | | |
| Safety Certification | | | UL1741, CSA-C22.2 No.107.1, EN62109 (Pending) | | | |
| MTBF | | | MIL-HDBK-217F@25°C $\geq 300,000$ h | | | |

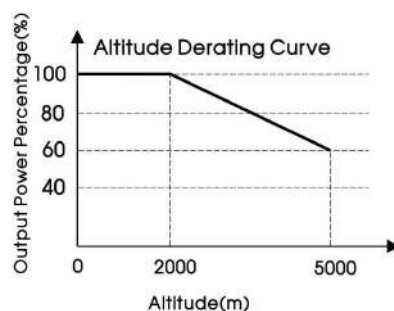
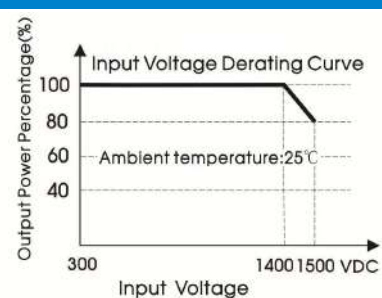
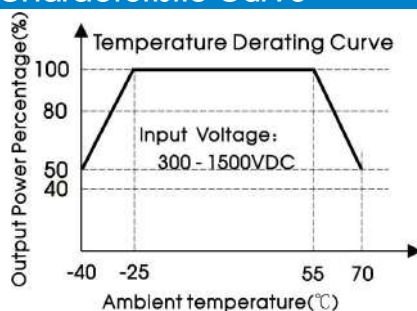
Physical Specifications

| | |
|-----------------|-----------------------|
| Casing Material | Metal |
| Dimensions | 215.00*125.00*50.00mm |
| Weight | 1370g (Typ.) |
| Cooling method | Free air convection |

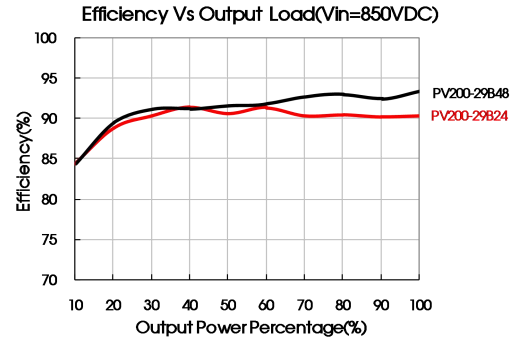
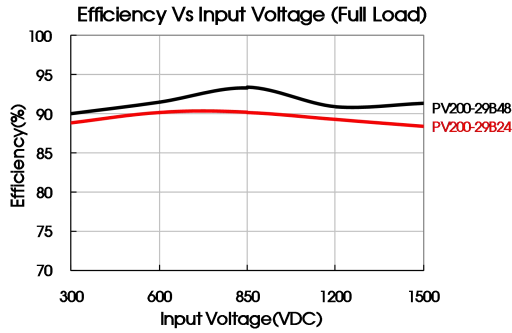
EMC Specifications

| | | | | |
|-----|-------|-----------------|--|------------------|
| EMI | CE | CISPR32/EN55032 | CLASS A | |
| | RE | CISPR32/EN55032 | CLASS A | |
| EMS | ESD | IEC/EN61000-4-2 | Contact $\pm 6\text{KV}$ /Air $\pm 8\text{KV}$ | Perf. Criteria B |
| | RS | IEC/EN61000-4-3 | 10V/m | perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | $\pm 2\text{KV}$ | perf. Criteria B |
| | Surge | IEC/EN61000-4-5 | line to line $\pm 1\text{KV}$ /line to ground $\pm 2\text{KV}$ | perf. Criteria B |
| | CS | IEC/EN61000-4-6 | 10Vr.m.s | perf. Criteria A |

Product Characteristic Curve

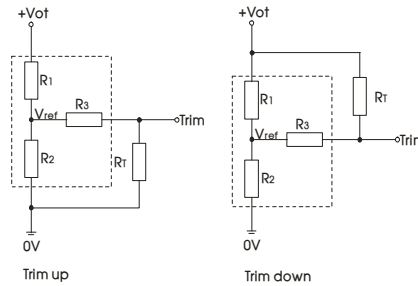


- Note: ① Input voltage should be derated based on temperature derating when it is 1400-1500VDC;
 ② For the PV200-29Bxx, altitude should be derated based on temperature de-rating profile when it is 2000 - 5000m;
 ③ This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.



设计参考

1. Application of Trim and calculation of Trim resistance



Applied circuits of Trim (Part in broken line is the interior of models)

Calculation formula of Trim resistance:

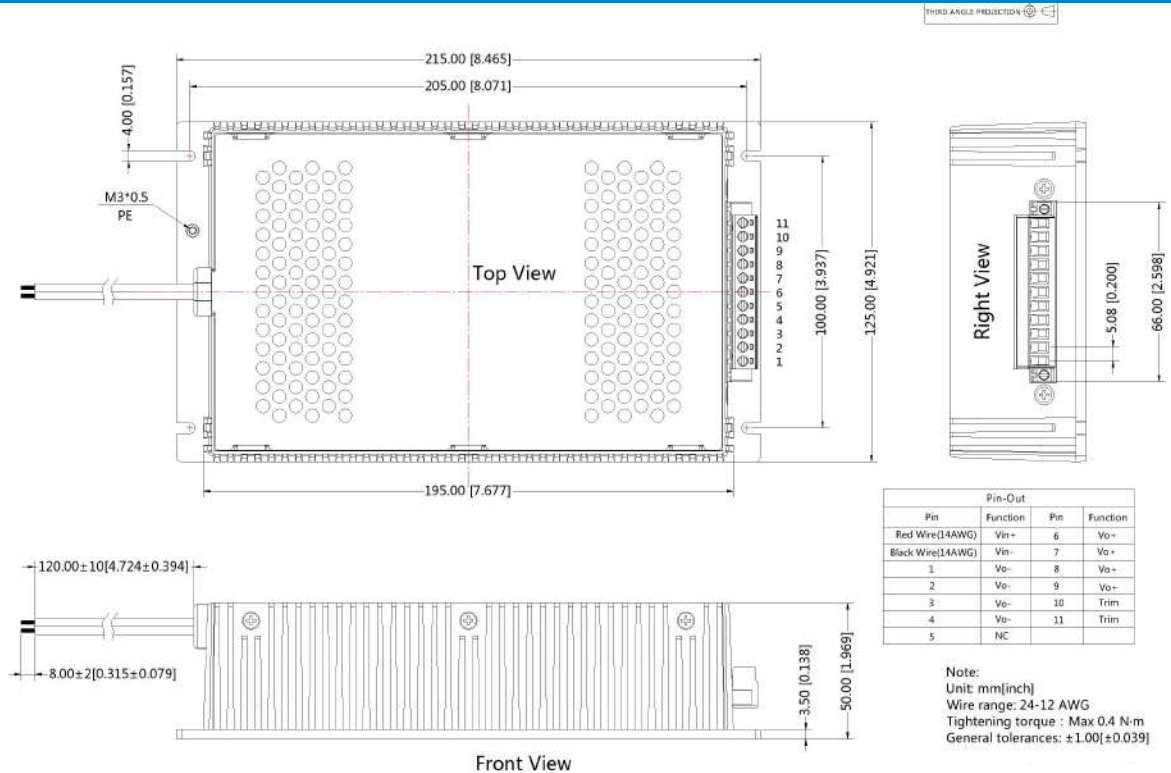
$$\begin{aligned} \text{up: } R_T &= \frac{\alpha R_2}{R_2 - \alpha} - R_3 & \alpha &= \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1 \\ \text{down: } R_T &= \frac{\alpha R_1}{R_1 - \alpha} - R_3 & \alpha &= \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2 \end{aligned}$$

R_T is Trim resistance
 α is a self-defined parameter, with no real meaning.

| Vout | R1(KΩ) | R2(KΩ) | R3(KΩ) | Vref(V) | Vot(V) |
|------|--------|--------|--------|---------|---|
| 24V | 8.66 | 1 | 1 | 2.5 | Output voltage after regulation, variation ≤ ±10% |
| 48V | 17.8 | 1 | 1 | 2.5 | |

2. For more information Please refer to Ultra-wide High Input Voltage PV Power Supply Application Guide

Dimensions and Recommended Layout



Note:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220053;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of $T_a=25^\circ\text{C}$, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. In order to improve the conversion efficiency, when the module is working under high pressure, the module may have certain audio noise, but does not affect the reliability of the product;
5. We can provide product customization service, please contact our technicians directly for specific information;
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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