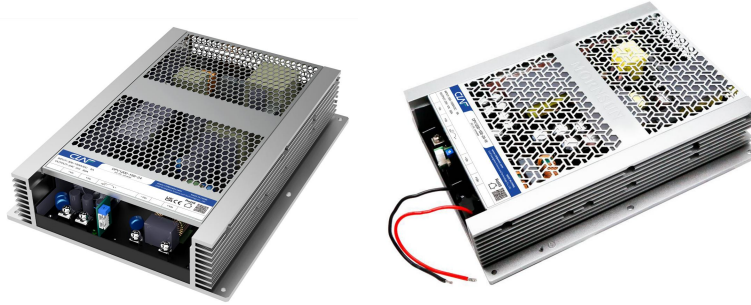


DESCRIPTIONS 1200W, DC/DC Converter



Report Report
 EN62109-1 BS EN62109-1

FEATURES

- Input voltage up to 1600VDC (Transient, duration: 10s)
- Ultra-wide 300 - 1500VDC input voltage range
- 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, over-temperature protection, output short circuit, over-current, over-voltage protection
- Support 3+1 parallel redundancy, current sharing
- Operating up to 5000m altitude
- Meets Class I (terminal), Class II (lead type)
- EFT immunity meets Level 4
- Design refer to CSA-C22.2 No.107.1, UL1741, EN/IEC/BS EN62109

APPLICATIONS

- Photovoltaic inverter
- Energy storage systems
- Industrial control

Selection Guide

| Certification | Model* | Output Power | Nominal Output Voltage and Current (Vo/Io) | Efficiency at 200VDC (%) Typ. | Capacitive Load (uF) Max. |
|---------------|----------------|--------------|--|-------------------------------|---------------------------|
| EN/BS EN | DPV1200-15B-12 | 900 | 12V/75A | 91 | 10000 |
| | DPV1200-15B-24 | 1200 | 24V/50A | 93 | 8800 |
| | DPV1200-15B-36 | | 36V/33.34A | 94 | 6600 |
| | DPV1200-15B-48 | | 48V/25A | 95 | 4400 |

Note:1. *Use suffix "-W" for lead type version.

2.The product picture is for reference only. For details, please refer to the actual product.

Specifications

| Product Specifications | Item | Operating Conditions | | Min. | Typ. | Max. | Unit | |
|-------------------------------------|-----------------------------------|---------------------------------------|-----------------------------------|--|-------|-----------------------|------|----|
| Input Specifications | Input Voltage Range | Transient (10s) | | -- | -- | 1600 | VDC | |
| | | | | 300 | -- | 1500 | | |
| | Input Current | 300VDC | | -- | -- | 5 | A | |
| | | 800VDC | | -- | -- | 2 | | |
| | Inrush Current | 1500VDC | Cold start | -- | 150 | -- | | |
| | Input Under-voltage Protection | | | Lockout activation range: 285 - 295V Lockout deactivation range: 290 - 300V Hysteresis voltage typical value: 5V | | | | |
| | Input Reverse Polarity Protection | | | Available | | | | |
| | External Input Fuse | | | 8A/1500VDC, required | | | | |
| Hot Plug | | | Unavailable | | | | | |
| Output Specifications | Output Voltage Accuracy | All load range | | -- | ±1 | -- | % | |
| | Line Regulation | Rated load | | -- | ±1 | -- | | |
| | Load Regulation | 800VDC | | -- | ±2 | -- | | |
| | Ripple & Noise* | 20MHz bandwidth (peak-to-peak value) | | -- | -- | 150 | mV | |
| | Stand-by Power Consumption | 300VDC | | -- | 3 | 5 | W | |
| | | 800VDC | | -- | 4 | 6 | | |
| | | 1500VDC | | -- | 5 | 8 | | |
| | Temperature Coefficient | | | -- | ±0.02 | -- | %/°C | |
| | Short Circuit Protection | | | Hiccup, continuous, self-recovery | | | | |
| | Over-voltage Protection | 12V | | ≤20V | | Output voltage hiccup | | |
| | | 24V | | ≤35V | | | | |
| | | 36V | | ≤50V | | | | |
| | | 48V | | ≤60V | | | | |
| | Over-current Protection | Full input voltage range | | 110% - 200% I _o , hiccup, self-recovery | | | | |
| | Over-temperature Protection** | Full voltage, full load, self-recover | Over-temperature protection start | | 60 | -- | 80 | °C |
| Over-temperature protection release | | | 45 | -- | 65 | | | |
| Minimum Load | | | 0 | -- | -- | % | | |
| Hold-up Time | Full load | 800VDC input | | -- | 5 | -- | ms | |
| Start-up Delay Time*** | | | -- | 1 | 3 | s | | |
| Output Voltage Adjustable | 12V | | 10.8 - 13.2 | | | | V | |
| | 24V | | 21.6 - 26.4 | | | | | |

| | | | | | | | | |
|---------------------------|-----------------------|--------------------------------|---|---|--------------------|----|--------|-----|
| | Range ADJ | | 36V | 32.4 - 39.6 | | | | |
| | | | 48V | 43.2 - 52.8 | | | | |
| | | | 12V | Output voltage adjustable range > 12.3V | Output power ≤900W | | | |
| | | | 24V | Output voltage adjustable range > 24.3V | | | | |
| | | | 36V | Output voltage adjustable range > 36.5V | | | | |
| | | | 48V | Output voltage adjustable range > 48.5V | | | | |
| Isolation | | Input - output | Electric Strength Test for 1min., leakage current < 5mA | 4000 | -- | -- | VAC | |
| | | Input - PE | Electric Strength Test for 1min., leakage current < 6mA | | | | | |
| | | Output - PE | Electric Strength Test for 1min., leakage current < 5mA | | | | | |
| Insulation Type | | | Primary and secondary meet reinforced insulation | | | | | |
| General Specifications | Insulation Resistance | Input - output | Testing voltage: 500VDC | 100 | -- | -- | MΩ | |
| | | Input - PE | | | | | | |
| | | Output - PE | | | | | | |
| Operating Temperature | | | -40 | -- | +85 | °C | | |
| Storage Temperature | | | -40 | -- | +85 | | | |
| Storage Humidity | | | Non-condensing | | -- | -- | 95 | %RH |
| Output Power Derating | | Operating temperature derating | +45°C to +55°C | 1.7 | -- | -- | % / °C | |
| | | | +55°C to +70°C | 2.2 | -- | -- | | |
| | | | +70°C to +85°C | 2.66 | -- | -- | | |
| | | Altitude derating | 3000- 5000m | 10 | -- | -- | %/Km | |
| Safety Class | | | Class I (terminal), Class II (lead type) | | | | | |
| MTBF | | | MIL-HDBK-217F@25°C | ≥ 300,000 h | | | | |
| Mechanical Specifications | Case Material | | Metal | | | | | |
| | Dimensions | | 292.00 x 225.00 x 58.00mm | | | | | |
| | Weight | | 4000g (Typ.) | | | | | |
| | Cooling Method | | Free air convection | | | | | |

Note: *The " Tip and barrel method" is used for ripple and noise test;

**Output voltage turn off, self-recovery after fault conditions is removed, the over-temperature point is the ambient temperature of the product;

***Full input voltage / output load range (the cooling-time between input power-off and power-on again is greater than 15s).

Electromagnetic Compatibility (EMC)

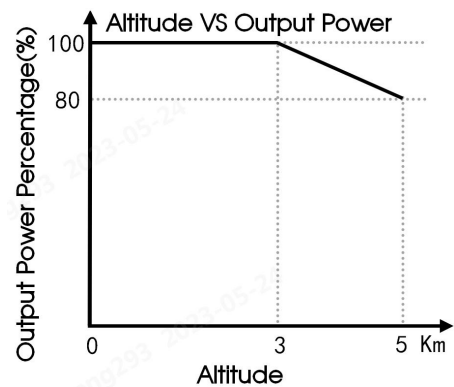
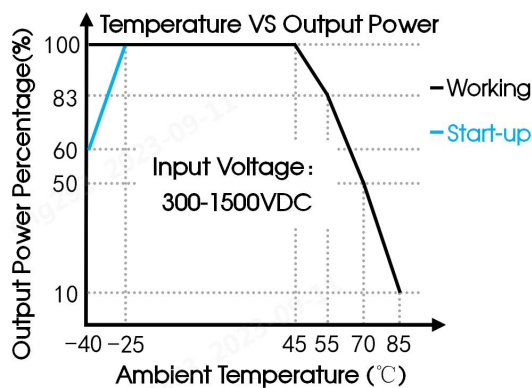
| | | | | | |
|--|-----------|-------|-----------------|---|------------------|
| Electromagnetic Compatibility (EMC) | Emissions | CE | CISPR32/EN55032 | CLASS A | |
| | | RE | CISPR32/EN55032 | CLASS A | |
| | Immunity | ESD | IEC/EN61000-4-2 | Contact ±6KV/Air ±8KV | Perf. Criteria A |
| | | RS | 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 PE ±2KV | Perf. Criteria A |
| | | | IEC/EN61000-4-5 | Line to line ±2KV/line to PE ±4KV (See Fig. 2 for recommended circuit) | Perf. Criteria A |
| | | CS | IEC/EN61000-4-6 | 10Vr.m.s | Perf. Criteria A |
| | | PFMF | IEC/EN61000-4-8 | 30A/m | Perf. Criteria A |

Note: PE connection is required for CLASS I (terminal) application; no PE connection is required for CLASS II (lead type) application.

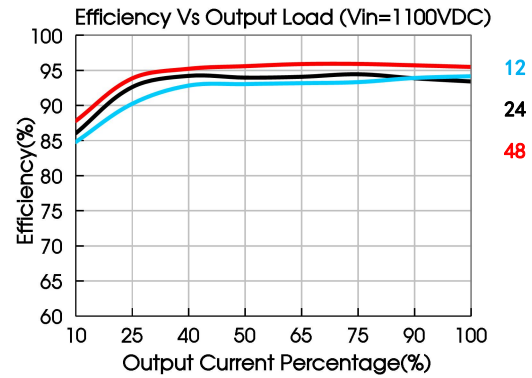
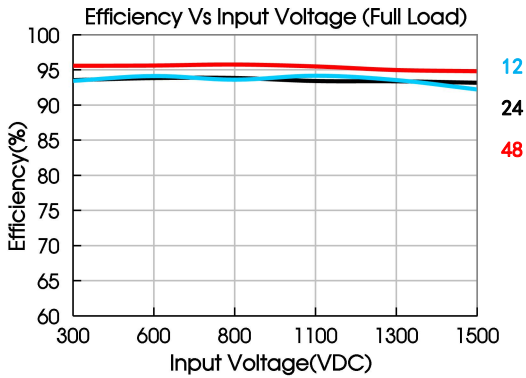
Functional Specifications

| Product Specifications | Item | Operating Conditions | Min. | Typ. | Max. | Unit | |
|----------------------------------|-------------------------------------|--|-----------|------|------|------|---|
| Functional Specifications | Current Sharing Accuracy (parallel) | Full input voltage range, when units in parallel, each power supply needs to carry a rated load of more than 50% | | -5 | -- | +5 | % |
| | Backflow Prevention | Applied voltage, product without damaging | 12V | -- | -- | 14 | V |
| | | | 24V | -- | -- | 28 | |
| | | | 36V | -- | -- | 41 | |
| | | | 48V | -- | -- | 54 | |
| External Enable Pin | External signal to EN pin | 1. Pulled high (5-15V) product no output 2. Disconnection or pulled low (< 0.3V) product normal output | | | | / | |
| LED Signal | Main output status indication | Normal output | Green on | | | | |
| | | Power off | Light off | | | | |

Product Characteristic Curve



Note: This product is suitable for applications using natural air cooling.



Design Reference

1. Typical application

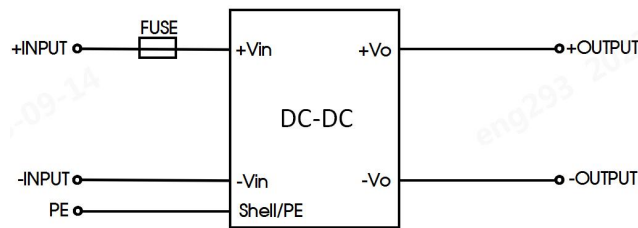


Fig. 1

| Part No. | FUSE |
|--|----------------------|
| DPV1200-15B-xx | 8A/1500VDC, required |
| Note: No PE connection is required for CLASS II application. | |

2. EMC compliance recommended circuit

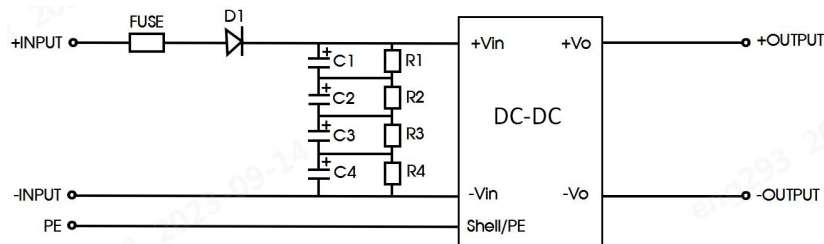


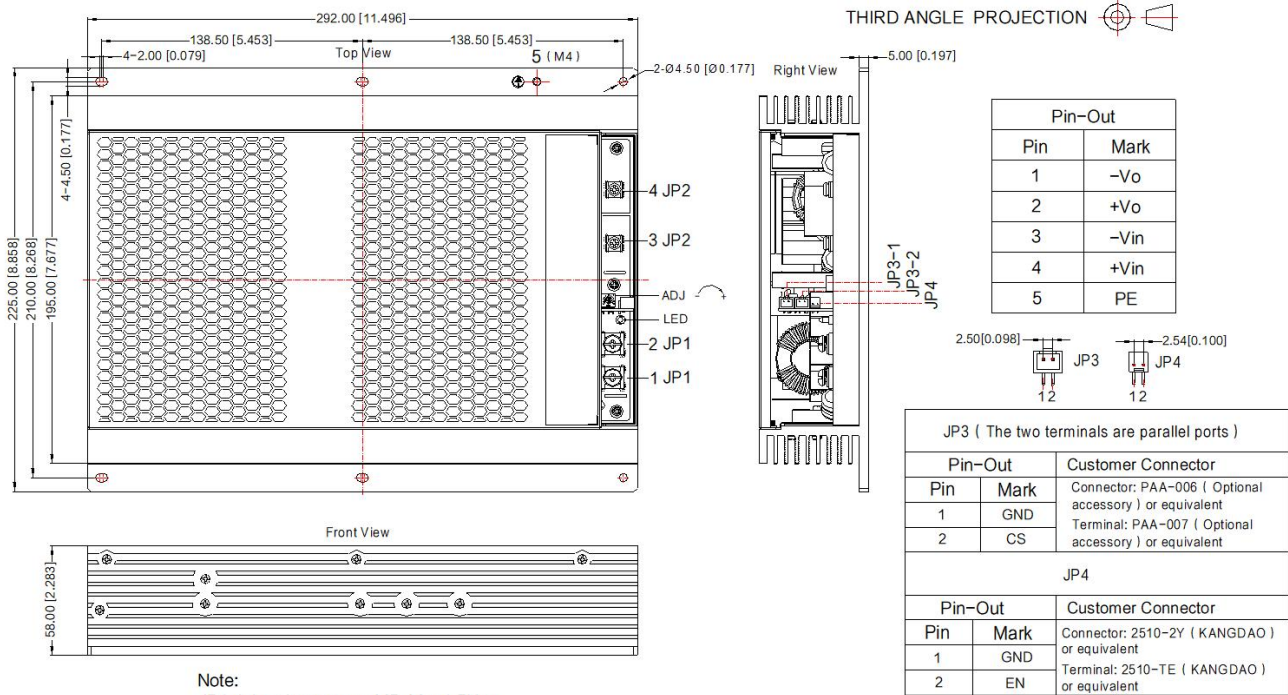
Fig. 2

| Model | Recommended value |
|--|---|
| FUSE | 8A/1500VDC, required |
| D1 | 4000V/50A (two 1000V/50A rectifier bridges in series) |
| C1/C2/C3/C4 | 100μF/450VDC |
| R1/R2/R3/R4 | 1MΩ/2W |
| Note: No PE connection is required for CLASS II application. | |

3. IMPORTANT SAFETY INSTRUCTIONS

Additional protective devices, such as lightning protector need to be added if there is an transient pulse voltage greater than 6KV at the Input of products in system applications.

Dimensions and Recommended Layout



Note:
 JP1 tightening torque: M5, Max1.5N·m
 JP2 tightening torque: M4, Max0.9N·m
 JP3 spec.: XHS2.5-2A
 JP4 spec.: A2542-02AW
 Unit: mm[inch]
 General tolerances: $\pm 1.00[\pm 0.039]$

 WARNING:

1. CAUTION: "To reduce the risk of fire, connect only to a circuit provided with 8 amperes maximum branch-circuit over-current protection in accordance with the National Electrical Code, ANSI/NFPA70."
2. WARNING: REPLACE ONLY WITH THE SAME RATINGS AND TYPE OF FUSE.
3. DANGER – HIGH VOLTAGE.

AVERTISSEMENT:

1. Avertissement: Pour réduire le risque d'incendie, veuillez connecter uniquement à des circuits de dérivation avec protection contre les surintensités conformes au code électrique national ANSI/ NFPA 70.
2. AVERTISSEMENT : N'UTILISER QUE DES FUSIBLES DE MÊME CALIBRE ET DE MÊME TYPE QUE LE FUSIBLE D'ORIGINE.
3. DANGER : HAUTE TENSION.

Note:

1. For additional information on Product Packaging;
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. The output voltage can be adjusted by the ADJ, clockwise to increase;
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.
8. If the final product application is connected to a photovoltaic array, the array needs to be grounded and the voltage between the positive and negative poles of the product shall not be greater than 1500VDC.



DPV1200-15B-xx Series Parallel Redundancy and Current Sharing Application Notes

Parallel Operating

1. Redundancy

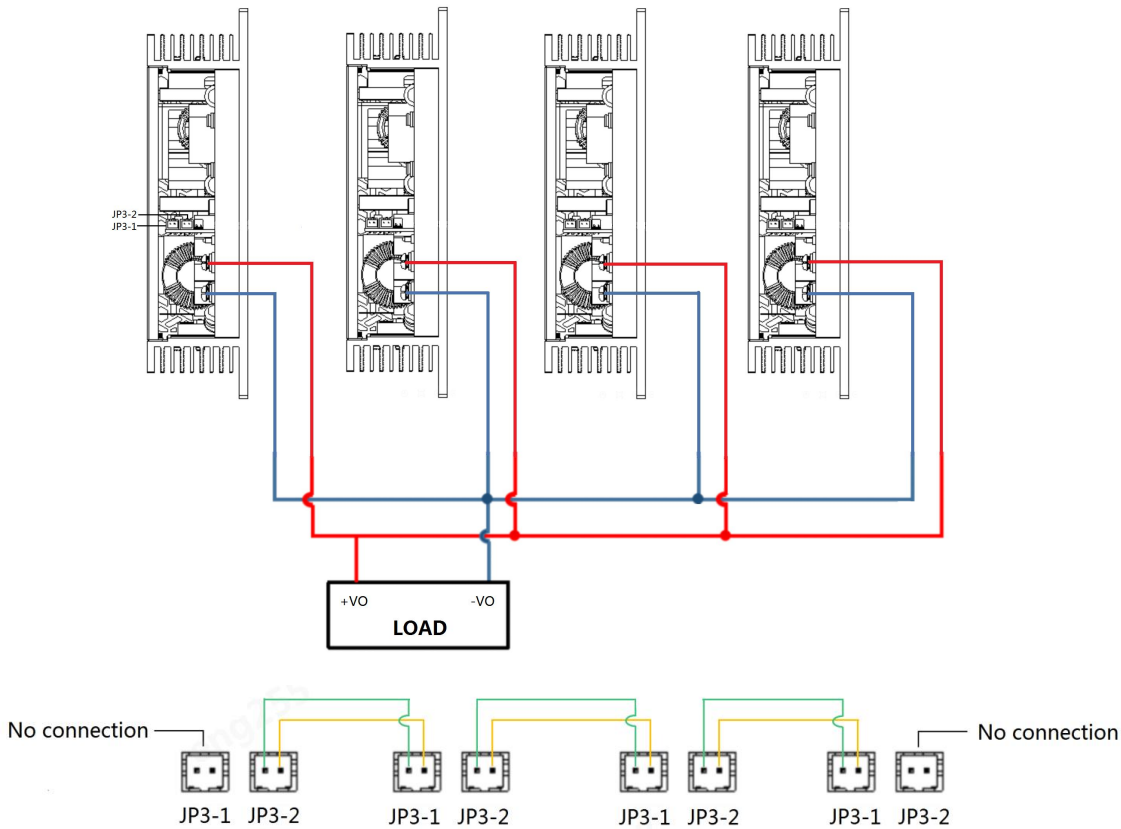
The output of the power module can be connected in parallel to achieve redundancy, thereby improving system reliability. The maximum power of the redundant system needs to be derated to ensure that the redundant system can still meet the rated load requirements when a power module fails. At present, the common practice is to build a redundant system using the N+1 method, that is, N+1 power supplies are connected in parallel. It supports the maximum load current $N \cdot I_{\text{omax}}$, where I_{omax} is the rated output current of each power supply, for example, the rated output current of each power supply is 50A, and 3+1 are only connected in parallel to build a $3 \cdot 50\text{A} = 150\text{A}$ redundant system.

The power modules support 3+1 parallel redundant operation. When any power module in the parallel connection fails, other power modules can continue to work.

Note: When used in parallel, the maximum load current cannot exceed the maximum output current of a single power module at startup, otherwise the entire parallel power supply system will not be able to start and work normally. When any power supply in the parallel connection fails, its current-sharing connection terminal needs to be removed to prevent other power modules from being affected by it, resulting in a decrease in output voltage.

2. Current Sharing

The each power module has a current sharing connection terminal (JP3). If the current sharing function is required, the current sharing terminals of all power modules must be connected together when working in parallel. The wiring method of the current sharing function is shown in the figure below:



Note: The JP3 ports of each power module have the same function, and there is no sequence.

The output voltage of each power module will affect the accuracy of current sharing. It is recommended that the output voltage of the power module be the rated voltage $\pm 50\text{mV}$. In practical applications, if the output voltage value needs to be adjusted, the output voltages of all parallel-connected power modules need to be adjusted to the same voltage. The recommended voltage range is: target voltage value $\pm 50\text{mV}$.

After the output load of each power module is greater than 50% of the rated load, the current sharing accuracy is required to be $\pm 5\%$. The formula for calculating the average current is:

$$\text{Current Sharing Accuracy} = \frac{I_{o \max} - I_{o \min}}{I_{o \text{total}}} * 100\%$$

$I_{o \max}$: The maximum output current value of the power modules connected in parallel

$I_{o \min}$: The minimum output current value of the power modules connected in parallel

$I_{o \text{total}} = I_{o \max} + I_{o \min}$