## DESCRIPTIONS

45W, DC-DC Converter




RoHS

## FEATURES

- Ultra-wide 250 - 2200VDC input voltage range (Transient 2300VDC last for 30s)
- Operating ambient temperature range: -40℃ to +85℃
- High I/O isolation voltage up to 5000VAC
- High reliability, efficiency up to 89%
- Input under-voltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage protection
- Operating altitude up to 5000m
- Design refer to UL1741, EN/IEC/BS EN62109, IEC62477

## APPLICATIONS

- Photovoltaic inverterl
- Energy storage systems
- Charging pile
- Industrial control

## Selection Guide

| Certification | Part No. | Output Power (W) | Nominal Output Voltage and Current (Vo/Io) | Efficiency at 1000VDC (%) Typ. | Capacitive Load (μF) Max. |
|---|---|---|---|---|---|
| / | DPV45-20B-12 | 45 | 12V/3.75A | 86 | 3000 |
| | DPV45-20B-15 | | 15V/3.00A | 86 | 3000 |
| | DPV45-20B-24 | | 24V/1.875A | 89 | 820 |

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 (30s) | -- | -- | 2300 | VDC |
| | | | 250 | -- | 2200 | |
| | Input Current | 250VDC | -- | -- | 0.2 | A |
| | | 800VDC | -- | -- | 0.08 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Inrush Current | 800VDC | Cold start | -- | 60 | -- | | |
| | | 2000VDC | | -- | 170 | -- | | |
| | Input Under-voltage Protection | Under-voltage protection start | | 100 | -- | 200 | VDC | |
| | | Under-voltage protection release | | 150 | -- | 250 | | |
| | Input Reverse Polarity Protection | | | Available | | | | |
| | External Input Fuse | | | 2000VDC/2A, required (brand: adler models: A901200b00 base models: BH300-01) | | | | |
| | Hot Plug | | | **Unavailable** | | | | |
| Output Specifications | Output Voltage Accuracy | Full load range | | -- | ±1.0 | ±2.0 | % | |
| | Line Regulation | Rated load | | -- | ±0.5 | -- | | |
| | Load Regulation | 1000VDC | | -- | ±0.5 | -- | | |
| | Minimum Load | | | 0 | -- | -- | | |
| | Ripple & Noise* | 20MHz bandwidth (peak-to-peak value) | | -- | 150 | 200 | mV | |
| | Stand-by Power Consumption | Full voltage range | | -- | 1.5 | 3.0 | W | |
| | Temperature Coefficient | | | -- | ±0.02 | -- | %/℃ | |
| | Short Circuit Protection | | | Hiccup, continuous, self-recovery | | | | |
| | Over-current Protection | | | 110% - 500% Io, self-recovery after fault conditions is removed | | | | |
| | Over-voltage Protection | 12V | | ≤20V | Output voltage clamp | | | |
| | | 15V | | ≤25V | | | | |
| | | 24V | | ≤30V | | | | |
| | Start-up Delay Time** | | | -- | 2 | 3 | s | |
| | Hold-up Time | 800VDC, full load | | -- | 10 | -- | ms | |
| General Specifications | Isolation | Input - output | Electric strength test for 1min., leakage current <3mA | | 5000 | -- | -- | VAC |
| | Insulation Resistance | Input - output | Test voltage: 500VDC | | 100 | -- | -- | MΩ |
| | Operating Temperature | | | | -40 | -- | +85 | ℃ |
| | Storage Temperature | | | | -40 | -- | +85 | |
| | Storage Humidity | | Non-condensing | | -- | -- | 95 | %RH |
| | Output Power Derating | Operating temperature derating | -40℃ to -25℃ | 250 - 300VDC | 2.00 | -- | -- | %/℃ |
| | | | +55℃ to +70℃ | 12V | 2.34 | -- | -- | |
| | | | +55℃ to +70℃ | 15/24V | 2.00 | -- | -- | |
| | | | +70℃ to +85℃ | | 3.33 | -- | -- | |
| | | Input voltage derating | 250 - 300VDC | | 0.80 | -- | -- | %/VDC |
| | | | 2000 - 2200VDC | | 0.10 | -- | -- | |
| | | Altitude | 2000 - 5000m | | 6.70 | -- | -- | %/Km |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | derating | | | | | |
| | Safety Class | | | Class II | | | |
| | MTBF | MIL-HDBK-217F@25℃ | | ≥300,000h | | | |
| Mechanical Specifications | Case Material | Black flame-retardant and heat-resistant plastic (UL94V-0) | | | | | |
| | Dimensions | 109.00 x 58.50 x 35.00mm | | | | | |
| | Weight | 315g (Typ.) | | | | | |
| | Cooling Method | Free air convection | | | | | |

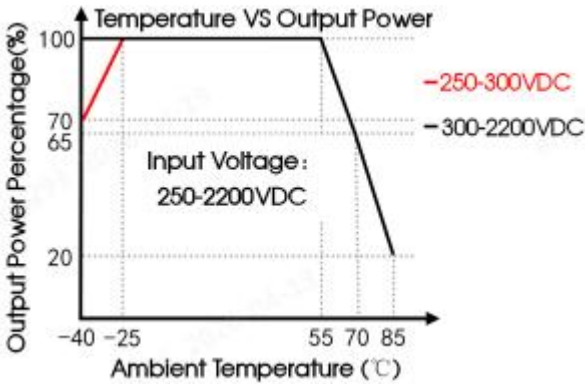
Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor;
**Continuous start time < 15s.

## Electromagnetic Compatibility (EMC)

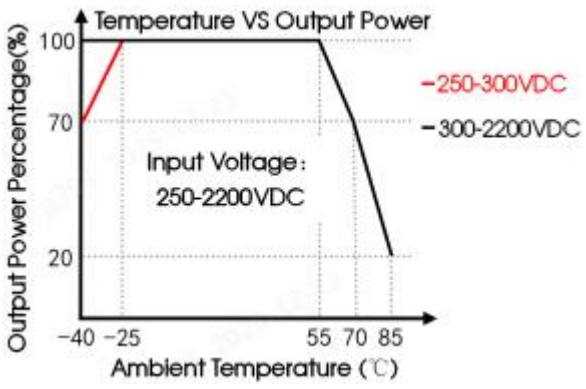
| | | | | |
|---|---|---|---|---|
| Electromagnetic Compatibility (EMC) | Emissions (EMI) | CE | CISPR32/EN55032 CLASS A (See Fig. 2 for recommended circuit) | |
| | | RE | CISPR32/EN55032 CLASS A | |
| | | EN61000-6-4 | | |
| | Immunity (EMS) | ESD | IEC/EN61000-4-2 Contact ±6KV/Air ±8KV | Perf. Criteria 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 ±2KV | Perf. Criteria A |
| | | CS | IEC/EN61000-4-6 10Vr.m.s | Perf. Criteria A |
| | | PFMF | IEC/EN61000-4-8 30A/m | Perf. Criteria A |
| | | EN55035, EN61000-6-2 | | |

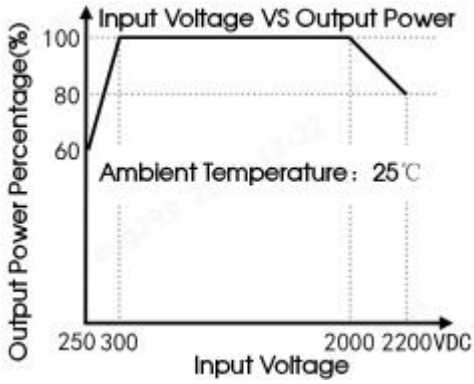
## Characteristic Curve

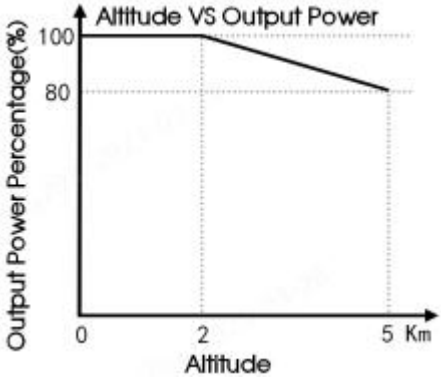
12V



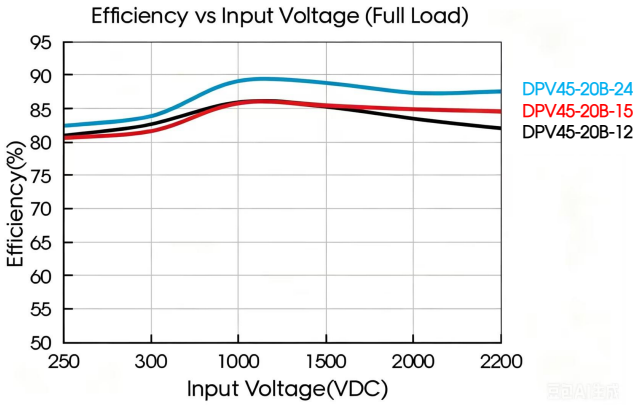

15V/24V

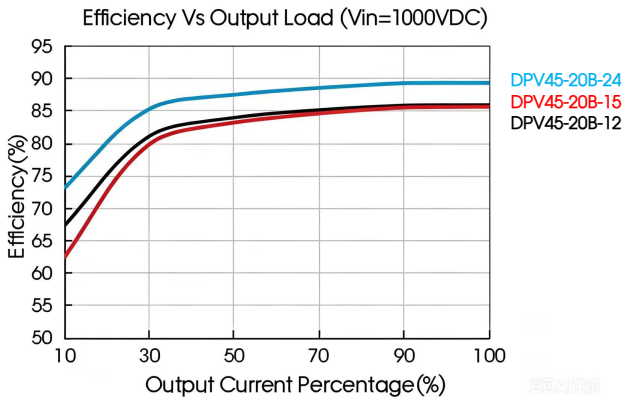





Note:1.With an DC input between 250-300VDC/2000-2200VDC, the output power must be derated as per temperature derating curves;
2.This product is suitable for applications using natural free air cooling; for applications in closed environment please consult FAE.




## Design Reference

1. Typical application

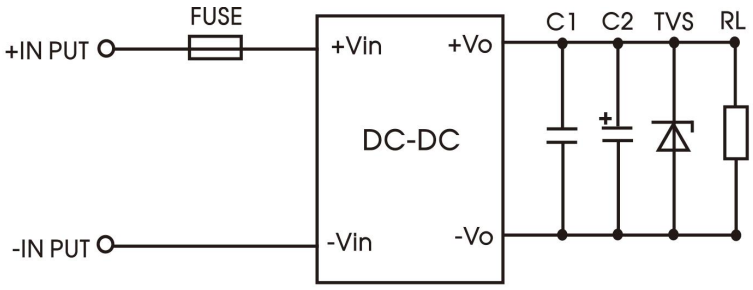



Fig. 1

| Part No. | FUSE | C1(μF) | C2(μF) | TVS |
|---|---|---|---|---|
| DPV45-20B-XX | 2000VDC/2A, required<br>(brand: adler models: A901200b00 base models: BH300-01) | 1μF/35V | 47uF/35V | SMBJ30A |

## 2.EMC compliance recommended circuit

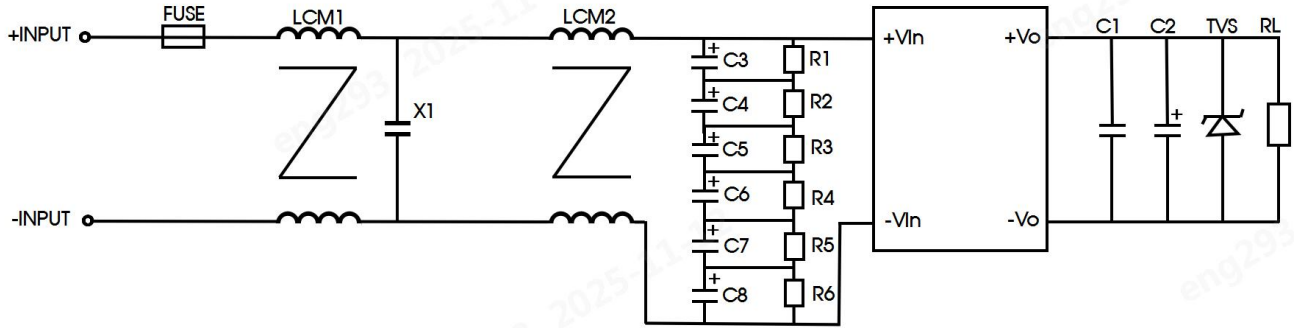
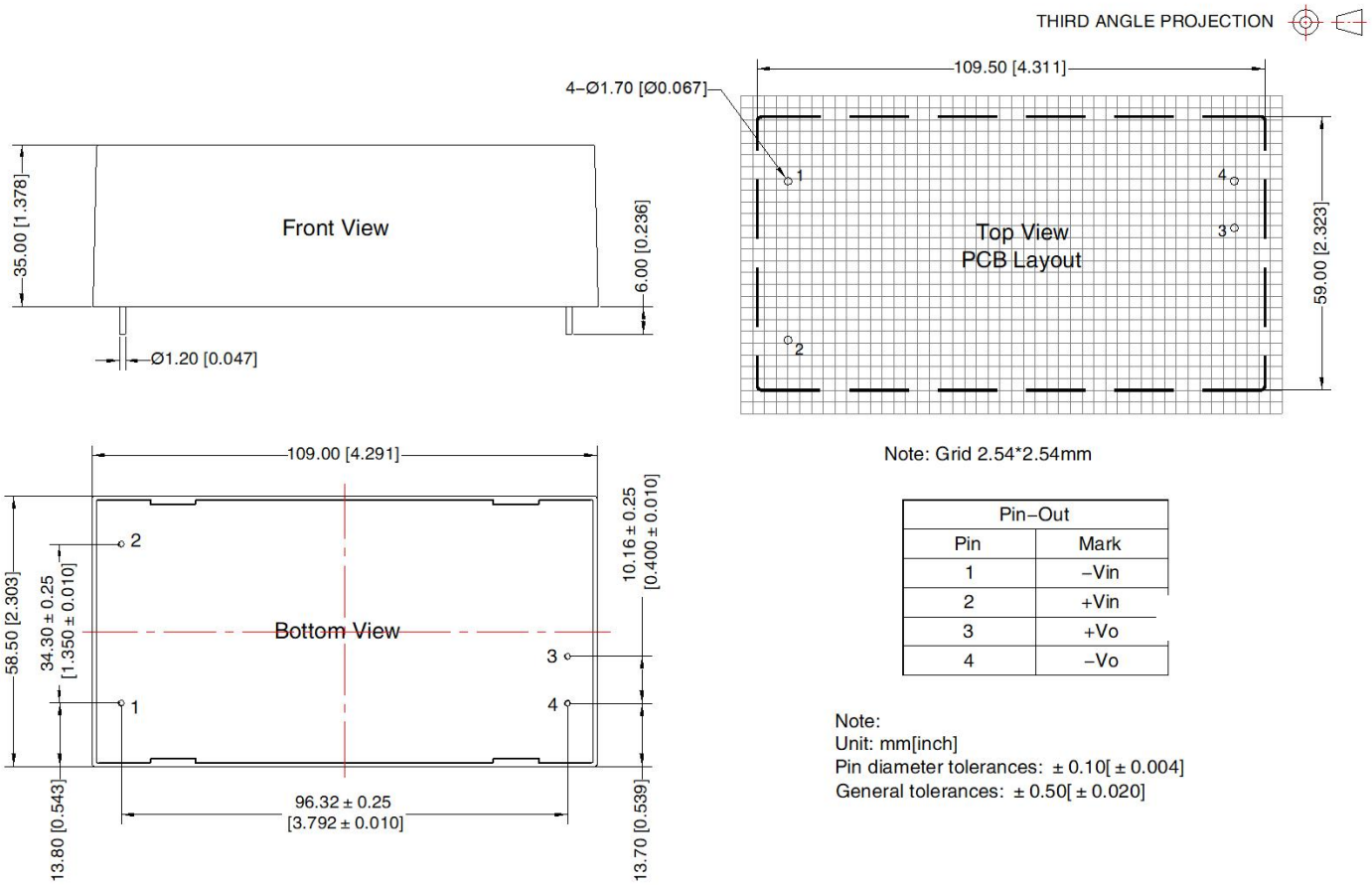



Fig 2: EMC application for higher compliance requirements (output parameters are show in Figure 1)

| Component | Recommended value |
|---|---|
| FUSE | 2000VDC/2A, required<br>(brand: adler models: A901200b00 base models: BH300-01) |
| LCM1 | 10mH/1A（F-class three-layer insulated wire） |
| LCM2 | 20mH/1A（F-class three-layer insulated wire） |
| X1 | 105K/2200V |
| C3、C4、C5、C6、C7、C8 | 10uF/450VDC |
| R1、R2、R3、R4、R5、R6 | 1MΩ/2W |

## Dimensions and Recommended




Note: Grid 2.54*2.54mm

| Pin–Out | |
|---|---|
| Pin | Mark |
| 1 | –Vin |
| 2 | +Vin |
| 3 | +Vo |
| 4 | –Vo |

Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10[ ± 0.004]
General tolerances: ± 0.50[ ± 0.020]

⚠WARNING:

1. CAUTION: "To reduce the risk of fire, connect only to a circuit provided with 2 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 MÊMECALIBRE ET DE MÊME TYPE QUE LE FUSIBLE DORIGINE.
3. DANGER : HAUTE TENSION.

Note:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load;
2. All index testing methods in this datasheet are based on our company corporate standards;
3. Products are related to laws and regulations: see "Features" and "EMC";
4. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
5. 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 2200VDC