

20W, AC/DC converter



FEATURES

- Ultra-wide 90 - 528VAC and 100 - 745VDC input voltage range
- Regulated output, low output ripple & noise
- Operating ambient temperature range : -40℃ to +70℃
- Output short circuit, over-current, over-voltage protection
- I/O isolation test voltage up to 4000VAC
- EFT /Surge: ±4KV Perf. Criteria B
- ES1 output (EN62368)
- EN62368 safety approval
- Design to meet UL62368 (12V/24V)

LD20-26Bxx Series is one of Mornsun's highly efficient green power AC-DC Converter series. They feature ultra-wide wide input range accepting either AC or DC voltage, low power consumption, high efficiency, high reliability and reinforced isolation. The converters meet EN62368 standards. The isolation voltage is 4000VAC between input and output. The converters meet IEC/EN61000-4, CISPR32/EN55032 standards and are widely used in electrical, instrumentation applications. Suitable for demanding high isolation voltage and strict electromagnetic compatibility of various terminal applications.

Selection Guide

| Certification | Part No.* | Output Power | Nominal Output Voltage and Current(Vo/Io) | Efficiency at 230VAC (%) Typ. | Capacitive Load (μF)Max. |
|---------------|------------|--------------|---|-------------------------------|--------------------------|
| EN | LD20-26B03 | 11.88W | 3.3V/3600mA | 74 | 10000 |
| | LD20-26B05 | 18W | 5V/3600mA | 78 | 10000 |
| | LD20-26B09 | 20W | 9V/2230mA | 79 | 7000 |
| IEC/EN | LD20-26B12 | | 12V/1660mA | 82 | 5000 |
| EN | LD20-26B15 | | 15V/1330mA | 83 | 3000 |
| IEC/EN | LD20-26B24 | | 24V/833mA | 83 | 1000 |

Note: 1. * Use suffix "A2" for chassis and suffix "A4" for DIN-Rail mounting.

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

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------|----------------------|-----------------------------------|------|------|------|
| Input Voltage Range | AC input | 90 | -- | 528 | VAC |
| | DC input | 100 | -- | 745 | VDC |
| Input Frequency | | 47 | -- | 63 | Hz |
| Input Current | 115VAC | -- | -- | 0.8 | A |
| | 230VAC | -- | -- | 0.4 | |
| Inrush Current | 115VAC | -- | 35 | -- | |
| | 230VAC | -- | 60 | -- | |
| Leakage Current | 230VAC/50Hz | 0.25mA RMS typ. | | | |
| Recommended External Input Fuse | | 3.15A/500VAC, slow-blow, required | | | |
| Hot Plug | | Unavailable | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|----------------------------|--------------------------------------|------|-------|------|------|
| Output Voltage Accuracy | LD20-26B03 | -- | ±3 | -- | % |
| | Others | -- | ±2 | -- | |
| Line Regulation | Full load | -- | ±0.5 | -- | |
| Load Regulation | 0% - 100% load | -- | ±1.0 | -- | |
| Ripple & Noise* | 20MHz bandwidth (peak-to-peak value) | -- | -- | 150 | mV |
| Temperature Coefficient | | -- | ±0.02 | -- | %/℃ |
| Stand-by Power Consumption | | -- | -- | 0.75 | W |

| | | | | | |
|--------------------------|---------------|-----------------------------------|-----|----|----|
| Short Circuit Protection | | Hiccup, continuous, self-recovery | | | |
| Over-current Protection | | 130 - 400%Io, self-recovery | | | |
| Over-voltage Protection | 3.3/5V output | ≤ 7.5 V (Output voltage clamp) | | | |
| | 9V output | ≤ 15 V (Output voltage clamp) | | | |
| | 12/15V output | ≤ 20 V (Output voltage clamp) | | | |
| | 24V output | ≤ 30 V (Output voltage clamp) | | | |
| Minimum Load | | 0 | -- | -- | % |
| Hold-up Time | 230VAC input | -- | 35 | -- | ms |
| | 400VAC input | -- | 100 | -- | |

Note: * The "parallel cable" method is used for ripple and noise test, please refer to AC-DC 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 |
| Operating Temperature | | Work in the power drop curve range | -40 | -- | +70 | ℃ |
| Storage Temperature | | | -40 | -- | +85 | |
| Storage Humidity | | | -- | -- | 95 | %RH |
| Soldering Temperature | | Wave-soldering | 260 ± 5℃; time: 5 - 10s | | | |
| | | Manual-welding | 360 ±10℃; time: 3 - 5s | | | |
| Switching Frequency | | | -- | 65 | -- | kHz |
| Power Derating | | +55℃ to +70℃ | 3.0 | -- | -- | % /℃ |
| | | -40℃ to -10℃ | 1.0 | -- | -- | |
| | | 90VAC - 110VAC | 2.0 | -- | -- | % /VAC |
| | | 480AVC - 528VAC | 0.417 | -- | -- | |
| Safety Standard | | 3V/5V/9V/12V/15V/24V | EN/BS EN62368-1Safety Approval; | | | |
| | | 12V/24V | IEC/EN/BS EN62368-1Safety Approval; Design refer to UL62368-1 | | | |
| Safety Class | | | CLASS II | | | |
| MTBF | | | MIL-HDBK-217F@25℃ > 300,000 h | | | |

Mechanical Specifications

| | | | |
|----------------|----------------------|---|--|
| Case Material | | Black plastic, flame-retardant and heat-resistant (UL94V-0) | |
| Dimension | Horizontal package | 70.00 x 48.00 x 30.00mm | |
| | A2 chassis mounting | 96.10 x 54.00 x 38.50 mm | |
| | A4 Din-Rail mounting | 96.10 x 54.00 x 43.10 mm | |
| Weight | Horizontal package | 160g (Typ.) | |
| | A2 chassis mounting | 210g (Typ.) | |
| | A4 Din-Rail mounting | 250g (Typ.) | |
| Cooling Method | | Free air convection | |

Electromagnetic Compatibility (EMC)

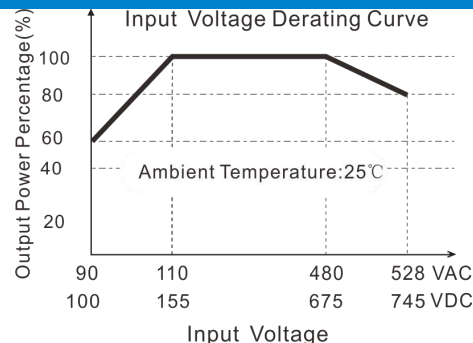
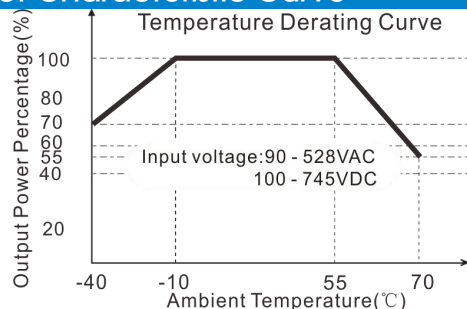
| | | | |
|-----------|-------|---|------------------|
| Emissions | CE | CISPR32/EN55032 CLASS B | |
| | RE | CISPR32/EN55032 CLASS B | |
| Immunity | ESD | IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV | perf. Criteria B |
| | RS | IEC/EN 61000-4-3 10V/m | perf. Criteria A |
| | EFT | IEC/EN 61000-4-4 ±2KV | perf. Criteria B |
| | | IEC/EN 61000-4-4 ±4KV (See Fig. 2 or Fig. 3 for recommended circuit) | perf. Criteria B |
| | Surge | IEC/EN 61000-4-5 line to line ±2KV | perf. Criteria B |
| | | IEC/EN 61000-4-5 line to line ±4KV (See Fig. 2 or Fig. 3 for recommended circuit) | perf. Criteria B |
| CS | | IEC/EN 61000-4-6 10Vr.m.s | perf. Criteria A |
| | | | perf. Criteria A |

Voltage dip, short
interruption and
voltage variation

IEC/EN61000-4-11 0%, 70%

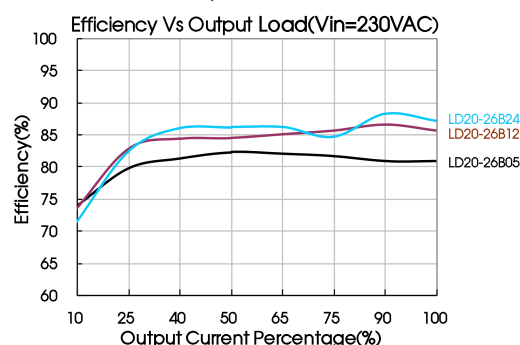
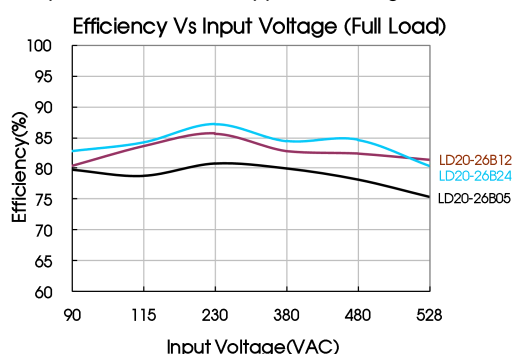
perf. Criteria B

Product Characteristic Curve



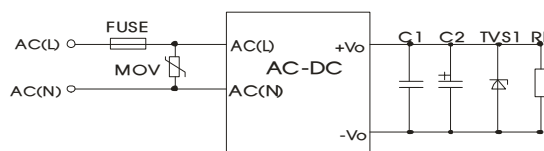
Note: ① With an AC input between 90-110VAC/ 480-528VAC and a DC input between 100-155VDC/675-745VDC, the output power must be derated as per temperature derating curves;

② This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.



Design Reference

1. Typical application



| Part No. | FUSE | MOV | C1 (uF) | C2 (uF) | TVS1 |
|------------|---|---------|---------|---------|----------|
| LD20-26B03 | 3.15A/500VAC, slow-blow, required | S20K625 | 1 | 330 | SMBJ7.0A |
| LD20-26B05 | | | | 330 | SMBJ7.0A |
| LD20-26B09 | | | | 220 | SMBJ12A |
| LD20-26B12 | | | | 220 | SMBJ20A |
| LD20-26B15 | | | | 220 | SMBJ20A |
| LD20-26B24 | | | | 220 | SMBJ30A |

Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

2. EMC compliance recommended circuit

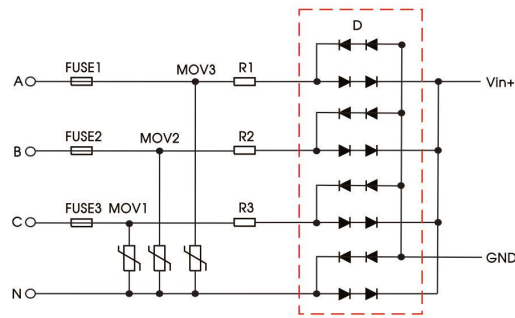


Fig. 2 Recommended circuit for applications which require 4kV differential-mode inrush standard (full-wave rectification)

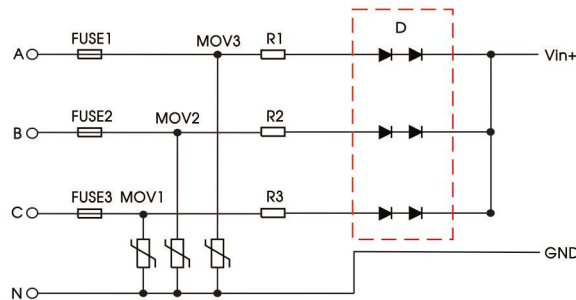


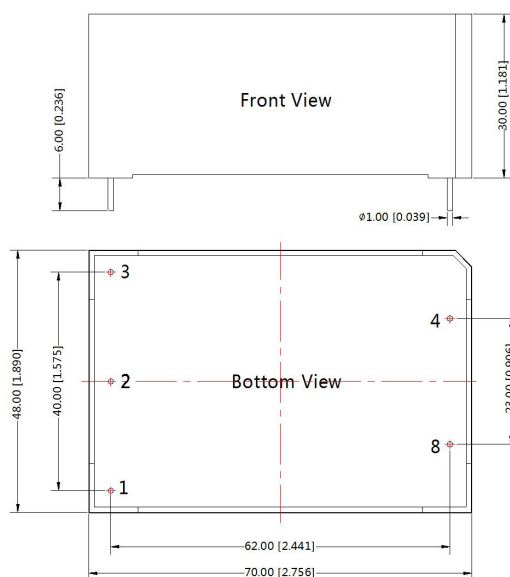
Fig. 3 Recommended circuit for applications which require 4kV differential-mode inrush standard (half-wave rectification)

| Recommend Parameter For Higher EMC Standard Circuit | |
|---|-----------------------------------|
| Component | Recommended value |
| MOV1, MOV2, MOV3 | S20K510 |
| D | 2A/1000V |
| R1, R2, R3 | 10Ω/5W |
| FUSE1, FUSE2, FUSE3 | 3.15A/500VAC, slow-blow, required |

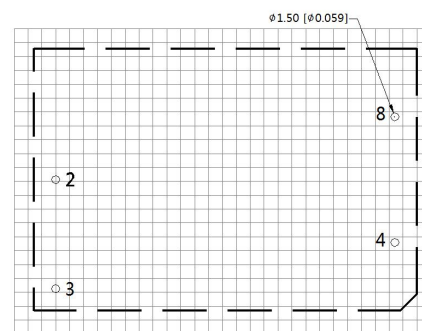
3. For additional information please refer to application notes on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



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

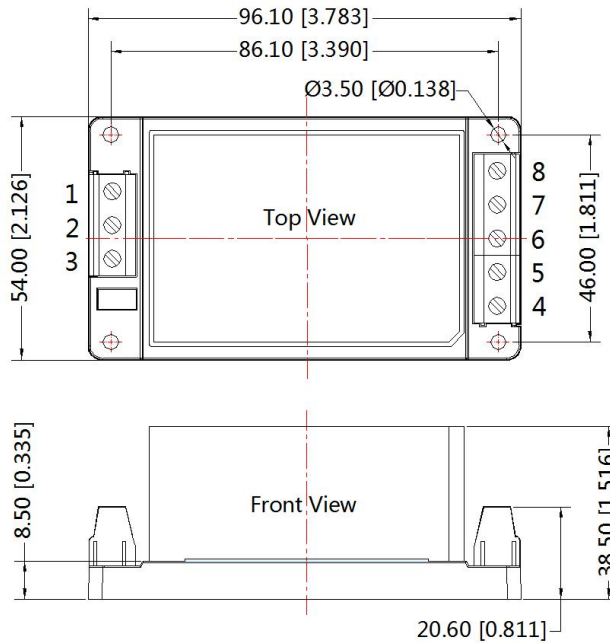


Note: Grid 2.54*2.54mm

| Pin-Out | |
|---------|----------|
| Pin | Function |
| 1 | No pin |
| 2 | AC(N) |
| 3 | AC(L) |
| 4 | +Vo |
| 8 | -Vo |

A2 Dimensions

THIRD ANGLE PROJECTION

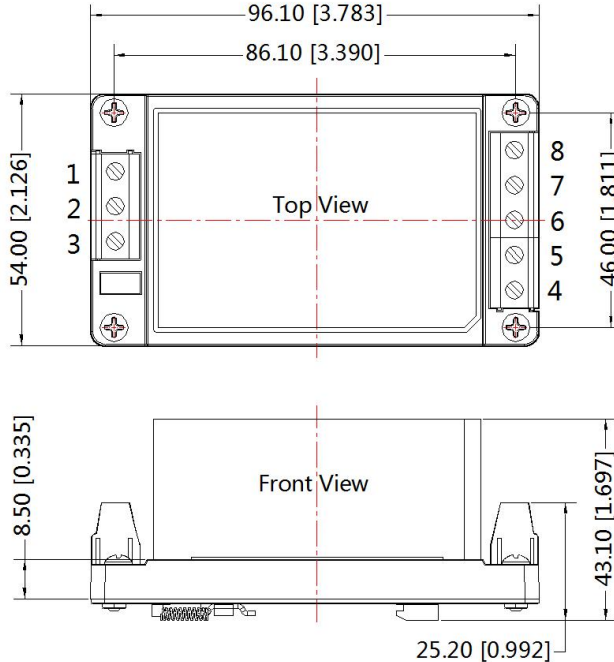


| Pin-Out | |
|---------|----------|
| Pin | Function |
| 1 | NC |
| 2 | AC(N) |
| 3 | AC(L) |
| 4 | +Vo |
| 5 | NC |
| 6 | NC |
| 7 | NC |
| 8 | -Vo |

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: $\pm 1.00[\pm 0.039]$

A4 Dimensions

THIRD ANGLE PROJECTION



| Pin-Out | |
|---------|----------|
| Pin | Function |
| 1 | NC |
| 2 | AC(N) |
| 3 | AC(L) |
| 4 | +Vo |
| 5 | NC |
| 6 | NC |
| 7 | NC |
| 8 | -Vo |

Note:
Unit: mm[inch]
Mounting rail: TS35, rail needs to connect safety ground
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: $\pm 1.00[\pm 0.039]$

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220017 (Horizontal package); 58220019(A2/A4 package);
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% 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, 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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