# Series AM10W-NZ

## 10 Watt | DC-DC Converter

### FEATURES:

- Super wide Input range
- Extremely High Input range up to 1500VDC
- Operating temperature of -40 to +70°C
- Over current and Over Voltage protection
- No minimum load required
- High efficiency of up to 80%
- I/O Isolation of 4000VAC
- Reversed connection protection

## Models
## Single output

| Model | Input Voltage (V) | Output Voltage (V) | Output Current max (A) | Isolation (VAC) | Max Capacitive Load (uF) | Efficiency (200VDC) (%) |
|---|---|---|---|---|---|---|
| AM10W-60005S-NZ** | 100-1000 | 5 | 2 | 4000 | 6000 | 72 |
| AM10W-60009S-NZ** | 100-1000 | 9 | 1.11 | 4000 | 4000 | 76 |
| AM10W-60024S-NZ** | 100-1000 | 24 | 0.42 | 4000 | 470 | 80 |
| | | | | | | |
| AM10W-80005S-NZ*** | 200-1500 | 5 | 2 | 4000 | 6000 | 64* |

*Measured at 800VDC nominal input.

**** For model "AM10W-60024S-NZ" only, add suffix "-STD" for optional DIN Rail screw terminal bottom plate.**

*****For 800VDC input models add suffix "-ST" for an optional DIN Rail screw terminal bottom plate with fuse and incorporated EMC filter, "STS" for an optional DIN Rail screw terminal bottom plate only**.

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

## Input Specifications

| Parameters | Nominal | Typical | Maximum | Units |
|---|---|---|---|---|
| Voltage range | 600VDC | | 100-1000 | VDC |
| | 800VDC | | 200-1500 | |
| Input Current | 600VDC input models - 200VDC | | 75 | mA |
| | 600VDC input models 600VDC | | 25 | |
| | 600VDC input models 1000VDC | | 16 | |
| | 800VDC input models - 200VDC | | 120 | |
| | 800VDC input models 800VDC | | 30 | |
| | 800VDC input models 1500VDC | | 16 | |
| Inrush current <2ms | 600VDC input models - 200VDC | 7 | | A |
| | 600VDC input models 600VDC | 20 | | |
| | 600VDC input models 1000VDC | 30 | | |
| | 800VDC input models - 200VDC | 30 | | |
| | 800VDC input models 800VDC | 80 | | |
| | 800VDC input models 1500VDC | 150 | | |
| External fuse | 600VDC input models, Slow blow | 1 | | A |
| | 800VDC input models, Slow blow | 15A/1500VDC | | |
| Startup time | 200-1000VDC | | 1 | s |
| | 200-1500VDC | | 2 | |
| Input under voltage protection | 800VDC input models only, ON | | 170-185 | VDC |
| | 800VDC input models only, OFF | | 180-195 | |

## Isolation Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Tested I/O voltage | 1 min | 4000 | | VAC |

## Output Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Voltage accuracy | | ±2 | | % |
| Line voltage regulation | LL-HL, full load | ±1 | | % of Vin |

| | | | | |
|---|---|---|---|---|
| Load voltage regulation | 0-100% load | ±1 | | % |
| Over voltage protection | Zener diode clamp | | | |
| Over current protection | 600VDC input models | | 110 | % of Iout |
| | 800VDC input models | | 120-320 | |
| Short Circuit protection | Continuous | | | |
| Short circuit restart | Auto recovery | | | |
| Temperature coefficient | | ±0.02 | | %/ºC |
| Ripple & Noise | 20MHz Bandwidth, 600VDC input models | 100 | 200 | mV p-p |
| | 20MHz Bandwidth, 800VDC input models | 150 | 300 | |

## General Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Switching frequency | 600VDC input models, 100% load | | 75 | KHz |
| | 800VDC input models, 100% load | 65 | | |
| Operating temperature | With derating | -40 to 70 | | °C |
| Storage temperature | -40 to 95 | | | °C |
| Maximum case temperature | | | 95 | °C |
| Cooling | Natural convection | | | |
| Humidity | | | 95 | % RH |
| Case material | Heat resistant, black plastic (UL94-V0) | | | |
| Weight | 600VDC input models | 95<br>With optional -STD mounting plate: 190 | | g |
| | 800VDC input models | 300<br>With optional -ST mounting plate: 610<br>With optional -STS mounting plate: 360 | | |
| Dimensions (L x W x H) | 600VDC input models<br>With optional -STD mounting plate: | 2.76 x 1.89 x 0.93 inches 70.00 x 48.00 x 23.50 mm<br>3.78 x 2.13 x 1.26 inches 96.10 x 54.00 x 36.60 mm | | |
| | 800VDC input models<br>With optional -ST mounting plate:<br>With optional -STS mounting plate: | 4.92 x 2.95 x 1.58 inches 125.00 x 75.00 x 40.00 mm<br>5.75 x 5.43 x 2.17 inches 146.00 x 138.00 x 55.00 mm<br>5.08 x 4.02 x 1.93 inches 129.00 x 102.00 x 49.00 mm | | |
| MTBF | >300,000 hrs (MIL-HDBK -217F, Ground Benign, t=+25ºC) | | | |
| Maximum soldering temperature | 600VDC input models, 1.5mm from case for 5-10 sec | | 260 | ºC |
| | 800VDC input models, 1.5mm from case for 3-5 sec | | 360 | |

## Safety Specifications

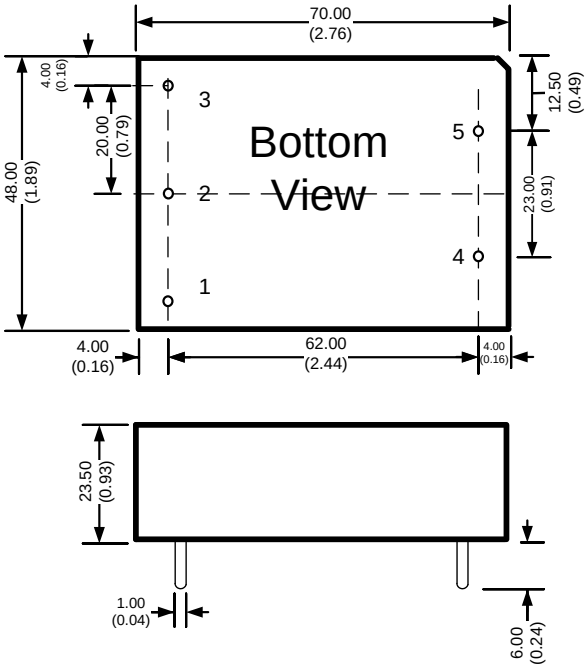
| Parameters | | |
|---|---|---|
| Approvals | CE | |
| Standards | Designed to meet CSA-C22.2 No.107.1-01, UL 1741, EN62109 | |
| | EMI - Conducted and radiated emission | EN55022, class A (with the recommended EMC circuit)<br>EN55024: 2010 |
| | Electrostatic Discharge Immunity | IEC 61000-4-2: Contact ±6KV/Air ±8KV, Criteria B |
| | RF, Electromagnetic Field Immunity | IEC 61000-4-3: 10V/m, Criteria A |
| | Electrical Fast Transient/Burst Immunity (600VDC Vin) | IEC 61000-4-4: ±4KV, Criteria B |
| | Electrical Fast Transient/Burst Immunity (800VDC Vin) | IEC 61000-4-4: ±2KV, Criteria B (with the recommended EMC circuit) |
| | Surge Immunity (600VDC Vin) | IEC 61000-4-5: ±2KV, Criteria B |
| | Surge Immunity (800VDC Vin) | IEC 61000-4-5: ±1KV, Criteria B (with the recommended EMC circuit) |
| | RF, Conducted Disturbance Immunity | IEC 61000-4-6: 10Vrms, Criteria A |
| | Power frequency Magnetic Field Immunity | IEC 61000-4-8: 10A/m, Criteria A |
| | Voltage dips, Short Interruptions Immunity | IEC 61000-4-11: 0-70%, Criteria B |

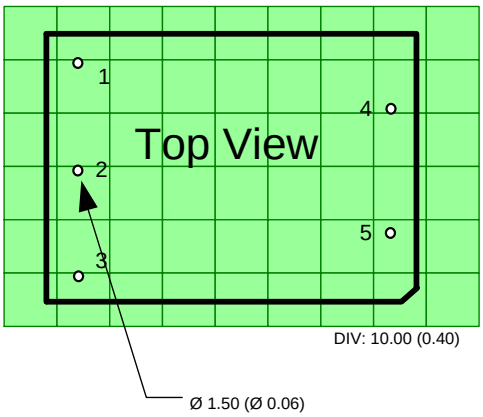
## Pin Out Specifications

| Pin | 600VDC Input |
|---|---|
| 1 | N.C. |
| 2 | -Vin |
| 3 | +Vin |
| 4 | -Vout |
| 5 | +Vout |

N.C. Not connected

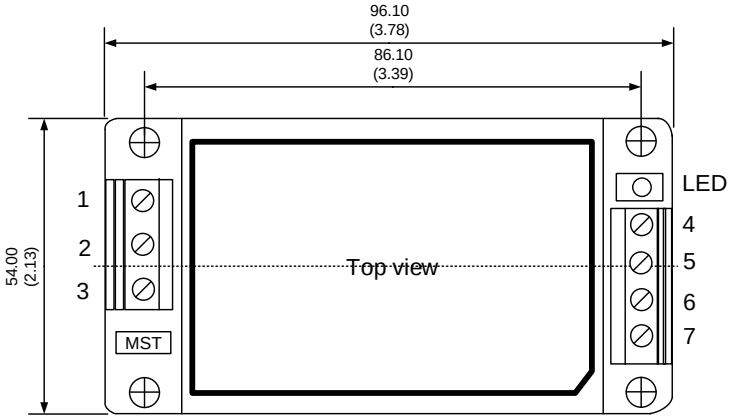
## Dimensions
## 600VDC input models



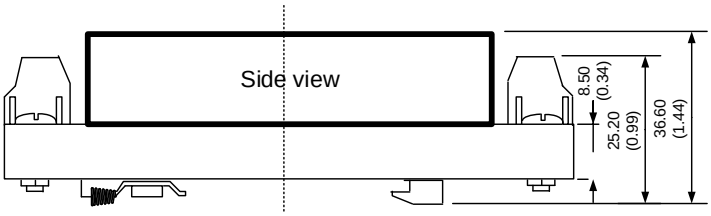




Dimensions mm (inch)
Case Tolerance ±0.50 (±0.02)
Pin Diameter ± 0.10 (± 0.004)

## 600VDC input models with optional -STD bottom plate



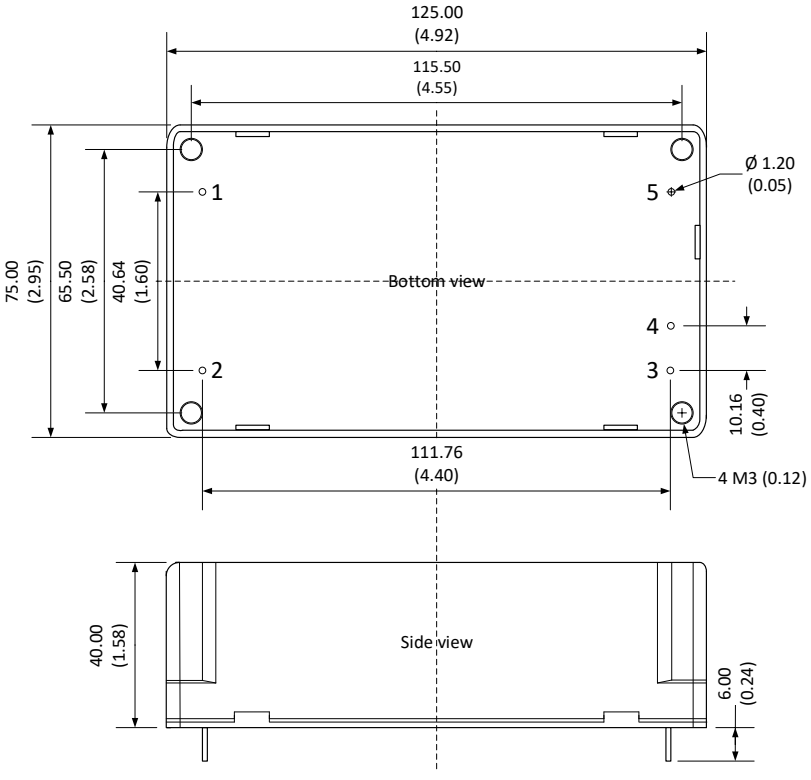

Dimensions: mm (inch)
Case Tolerance:± 0.50 (0.02)
Wire gauge: 24-12AWG
DIN Rail TS35




### Pin Out Specifications

| Pin | Single |
|---|---|
| 1 | -Vin |
| 2 | N.C. |
| 3 | +Vin |
| 4 | -Vout |
| 5 | N.C. |
| 6 | N.C. |
| 7 | +Vout |

## 800VDC input models

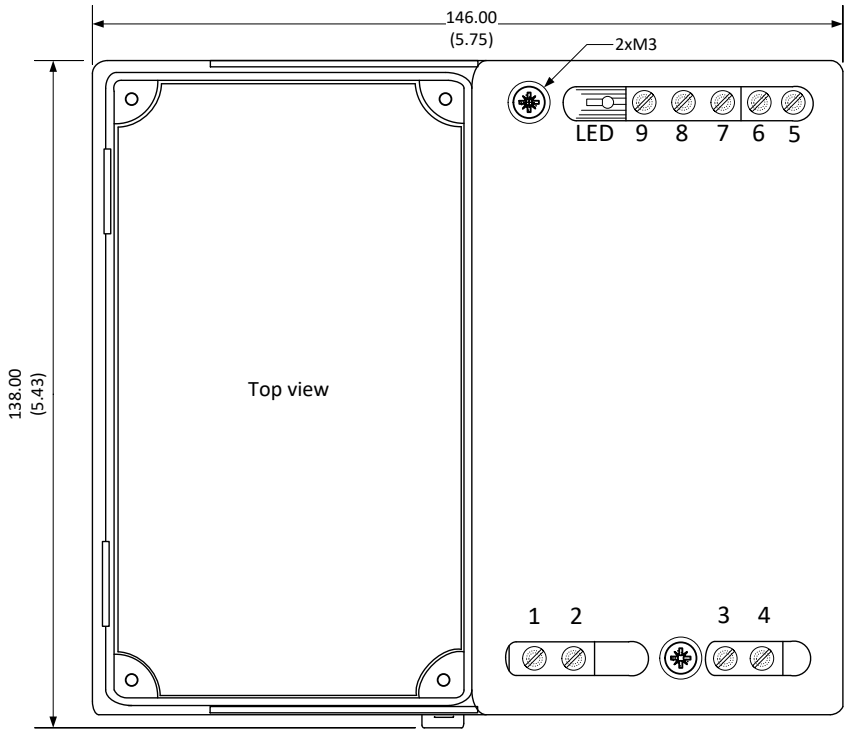


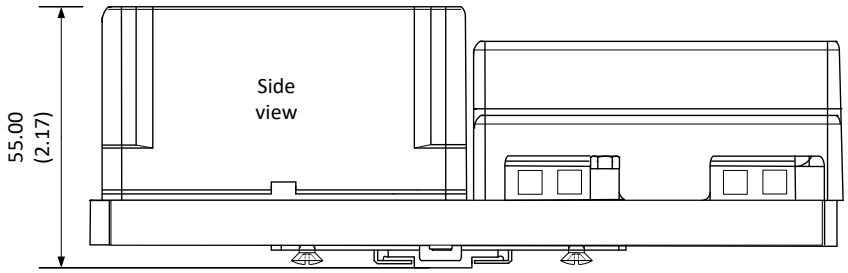

Dimensions mm (inch)
Case Tolerance ±0.50 (±0.02)
Pin Diameter Tolerance ± 0.10 (± 0.004)
Pin Length Tolerance ± 1.50 (± 0.06)

### Pin Out Specifications

| Pin | 800VDC Input |
|---|---|
| 1 | +Vin |
| 2 | -Vin |
| 3 | +Vout |
| 4 | -Vout |
| 5 | N.C. |

## 800VDC input models with optional -ST bottom plate




Dimensions mm (inch)

Installed on DIN rail type TS35
Wire: 24-12AWG
Case Tolerance ±0.50 (±0.02)
General Tolerance ± 1.00 (± 0.04)

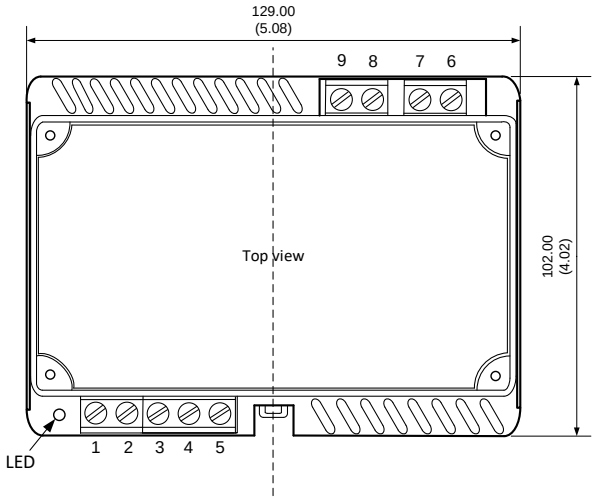
## Pin Out Specifications

| Pin | Single |
|---|---|
| 1 | -Vin |
| 2 | -Vin |
| 3 | +Vin |
| 4 | +Vin |
| 5 | +Vout |
| 6 | -Vout |
| 7 | N.C. |
| 8 | N.C. |
| 9 | N.C. |

NOTES:

1. To replace the internal fuse in the models with suffix “-ST”, unscrew the 2 screws on the top side of the plate.
2. DIN rail metal holder needs to be grounded.
3. Horizontal mounting recommended.

## 800VDC input models with optional -STS bottom plate

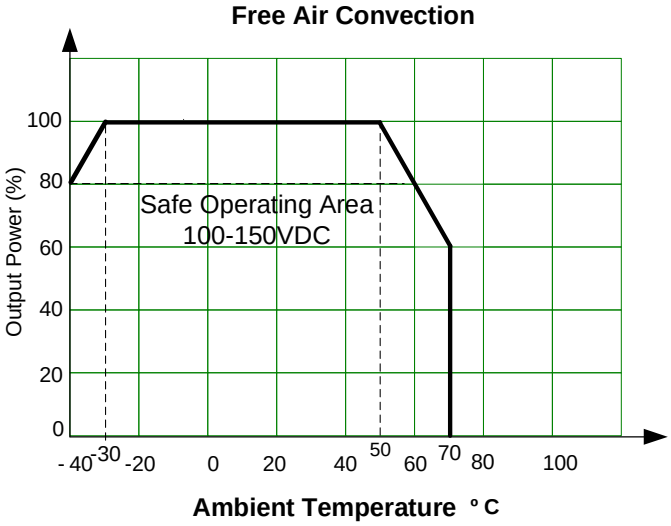


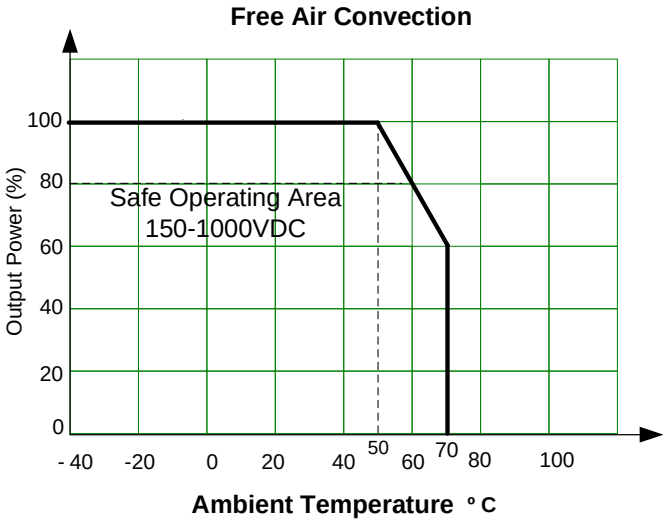

## Pin Out Specifications

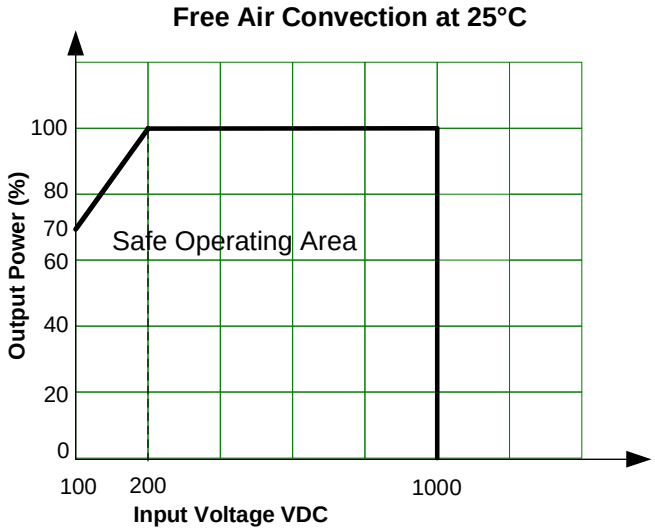
| Pin | Single |
|---|---|
| 1 | +V out |
| 2 | -V out |
| 3 | N.C. |
| 4 | N.C. |
| 5 | N.C. |
| 6 | +V in |
| 7 | +V in |
| 8 | -V in |
| 9 | -V in |

## Derating

## 600VDC input models

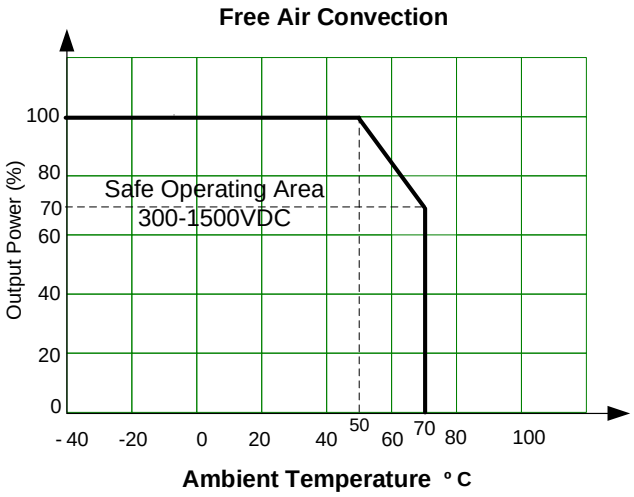


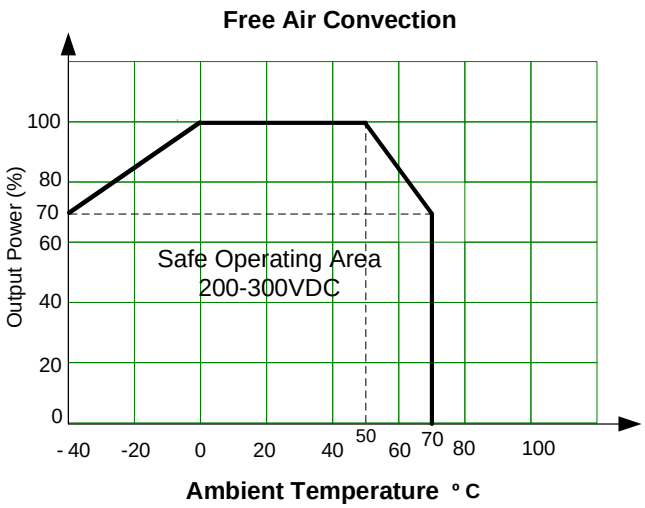



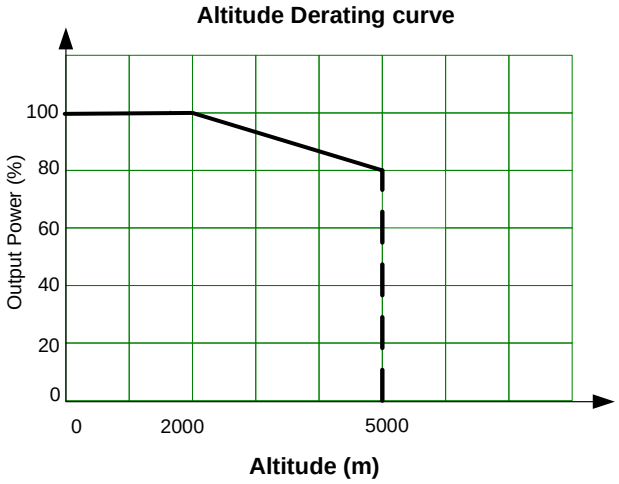

NOTE: 1. Derated Pout = Pout * temp. derating * Vin derating.
2. Sufficient air space for natural air flow around must be considered.

## 800VDC input models*

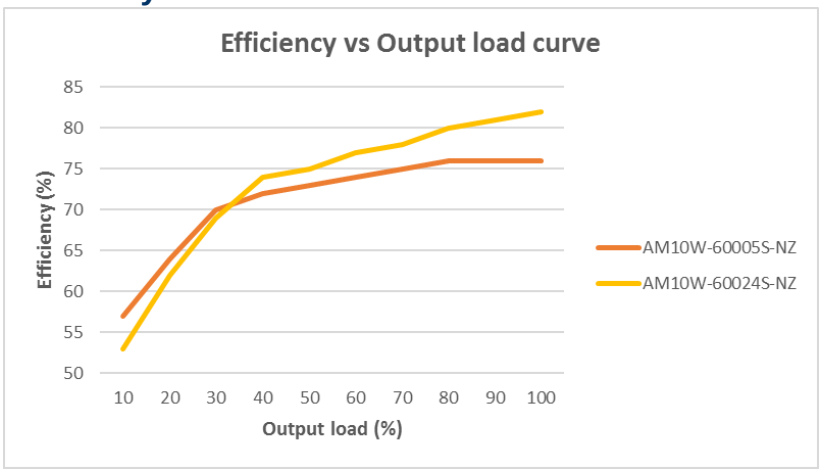


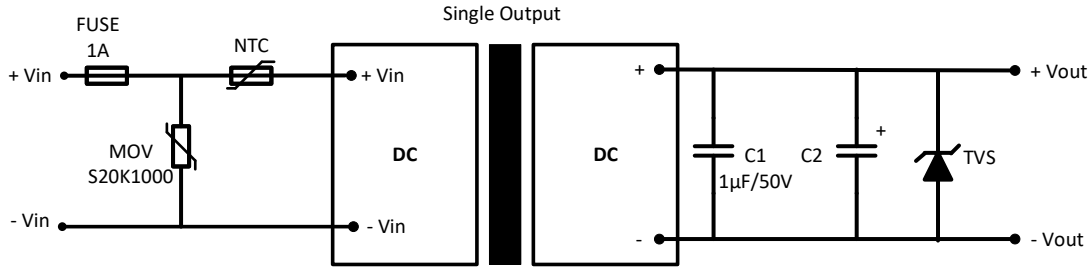

*NOTE: Derating is indicated at natural convection. Sufficient air space around is needed.




## Efficiency curve



## Typical Application circuit *

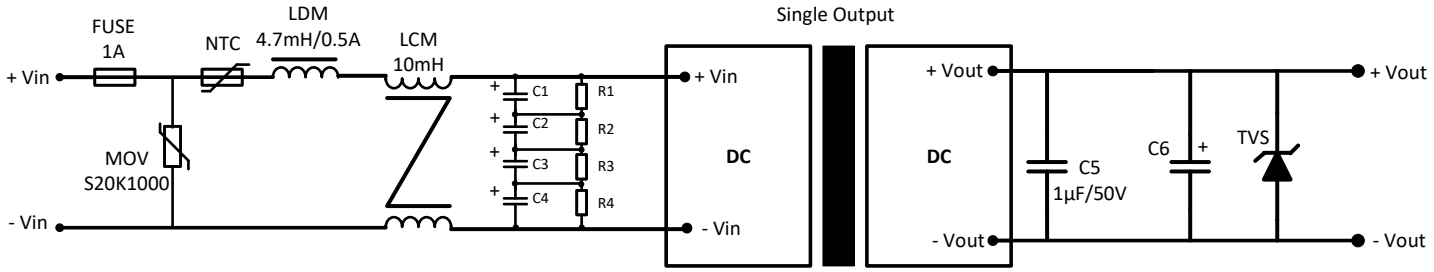



| Model | C2 | TVS |
|---|---|---|
| 5 Vout | 220 µF / 35V | 7V |
| 9 Vout | 120 µF / 35V | 12V |
| 24 Vout | 68 µF / 35V | 33V |

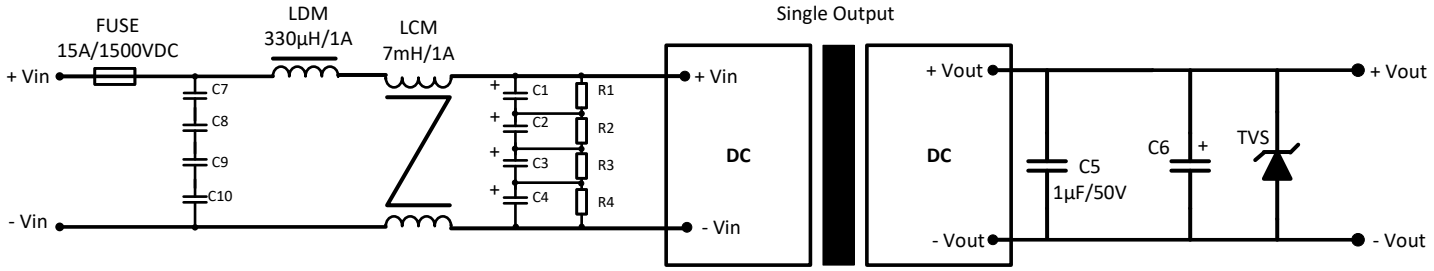
*NOTE: For 800VDC Input models NTC and MOV are not needed. For 800VDC input models with suffix "-ST" this external circuit is not needed.

## Recommended EMC Circuit

### 600VDC input models




### 800VDC input models




| Model | C1, C2, C3 & C4 | C7, C8, C9 & C10 | R1, R2, R3 & R4 | C6 | TVS |
|---|---|---|---|---|---|
| 5 Vout | 47 µF/450V | 100 nF/275V | 1MΩ / 2W | 220 µF / 35V | 7V |
| 9 Vout | | | | 120 µF / 35V | 12V |
| 24 Vout | | | | 68 µF / 35V | 33V |

***NOTE: For 800VDC input models with suffix "-ST" this external EMC circuit is not needed.**

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