aimtec
Your Power Partner

# Series AM1M-NZ

## 1 Watt | DC-DC Converter




### FEATURES:

- Low Profile DIP14 case
- 1.5 and 3K VDC I/O Isolation
- Continuous Short circuit protection
- Operating Temperature: -40°C to +105°C
- High Power Density
- Low Isolation Capacitance

## Models
## Single output

| Model | Input Voltage (V) | Max Input Current Full/No Load (mA) | Output Voltage (V) | Full load Output Max Current (mA) | Isolation (VDC) | Maximum Capacitive Load (µF) | Efficiency (%) |
|---|---|---|---|---|---|---|---|
| AM1M-0505S-NZ* | 4.5-5.5 | 250/25 | 5 | 200 | 1500 | 220 | 74 |
| AM1M-1205S-NZ | 10.8-13.2 | 115/15 | 5 | 200 | 1500 | 220 | 73 |
| | | | | | | | |
| AM1M-0303SH30-NZ ※ | 2.97-3.63 | 420/30 | 3.3 | 303 | 3000 | 220 | 72 |
| AM1M-0503SH30-NZ | 4.5-5.5 | 256/20 | 3.3 | 303 | 3000 | 220 | 75 |
| AM1M-0505SH30-NZ | 4.5-5.5 | 256/20 | 5 | 200 | 3000 | 220 | 80 |
| AM1M-0512SH30-NZ | 4.5-5.5 | 256/20 | 12 | 83 | 3000 | 220 | 80 |
| AM1M-0515SH30-NZ | 4.5-5.5 | 256/20 | 15 | 67 | 3000 | 220 | 81 |
| AM1M-1205SH30-NZ | 10.8-13.2 | 106/15 | 5 | 200 | 3000 | 220 | 80 |
| AM1M-1212SH30-NZ | 10.8-13.2 | 106/15 | 12 | 83 | 3000 | 220 | 80 |
| AM1M-1215SH30-NZ | 10.8-13.2 | 106/15 | 15 | 67 | 3000 | 220 | 81 |
| AM1M-1515SH30-NZ | 13.5-16.5 | 84/10 | 15 | 67 | 3000 | 220 | 80 |
| AM1M-2405SH30-NZ | 21.6-26.4 | 54/7 | 5 | 200 | 3000 | 220 | 79 |

## Models
## Dual output

| Model | Input Voltage (V) | Max Input Current Full/No Load (mA) | Output Voltage (V) | Full load Output Max Current (mA) | Isolation (VDC) | Maximum Capacitive Load (µF) | Efficiency (%) |
|---|---|---|---|---|---|---|---|
| AM1M-0524D-NZ ※ | 4.5-5.5 | 256/25 | ±24 | ±21 | 1500 | 100 | 80 |
| AM1M-1205D-NZ* | 10.8-13.2 | 106/15 | ±5 | ±100 | 1500 | 100 | 80 |
| AM1M-1212D-NZ* | 10.8-13.2 | 106/15 | ±12 | ±42 | 1500 | 100 | 80 |
| AM1M-1224D-NZ* | 10.8-13.2 | 106/15 | ±24 | ±21 | 1500 | 100 | 81 |
| AM1M-1524D-NZ | 13.5-16.5 | 82/12 | ±24 | ±21 | 1500 | 100 | 81 |
| AM1M-2409D-NZ* | 21.6-26.4 | 54/7 | ±9 | ±56 | 1500 | 100 | 80 |
| AM1M-2412D-NZ* | 21.6-26.4 | 54/7 | ±12 | ±42 | 1500 | 100 | 80 |
| AM1M-2415D-NZ* | 21.6-26.4 | 54/7 | ±15 | ±34 | 1500 | 100 | 80 |
| | | | | | | | |
| AM1M-0505DH30-NZ | 4.5-5.5 | 256/20 | ±5 | ±100 | 3000 | 100 | 79 |
| AM1M-0512DH30-NZ | 4.5-5.5 | 256/20 | ±12 | ±42 | 3000 | 100 | 80 |
| AM1M-0515DH30-NZ | 4.5-5.5 | 256/20 | ±15 | ±34 | 3000 | 100 | 81 |
| AM1M-1205DH30-NZ | 10.8-13.2 | 106/15 | ±5 | ±100 | 3000 | 100 | 80 |
| AM1M-2412DH30-NZ | 21.6-26.4 | 54/7 | ±12 | ±42 | 3000 | 100 | 81 |
| AM1M-2415DH30-NZ | 21.6-26.4 | 54/7 | ±15 | ±34 | 3000 | 100 | 80 |

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.

**NOTE2: The models marked with ※ will be discontinued (EOL) by December 30, 2020.**

## Input Specifications

| Parameters | Nominal | Typical | Maximum | Units |
|---|---|---|---|---|
| Voltage range | 3.3<br>5<br>12<br>15<br>24 | 2.97-3.63<br>4.5-5.5<br>10.8-13.2<br>13.5-16.5<br>21.6-26.4 | | VDC |
| Absolute Max Input Voltage (100ms) | 3.3V<br>5V<br>12V<br>15V<br>24V | | -0.7 - 5<br>-0.7 - 9<br>-0.7 - 18<br>-0.7 - 21<br>-0.7 - 30 | VDC |
| Filter | Capacitor | | | |
| Input reflected ripple current | | 15 | | mA p-p |

## Isolation Specifications

| Parameters | Conditions | Typical | Rated | Units |
|---|---|---|---|---|
| Tested I/O voltage | 60 Sec, <1mA | | 1500, 3000 | VDC |
| Isolation Resistance | 500Vdc | >1000 | | MOhm |
| Isolation Capacitance | 100KHz/0.1V | 20 | | pF |
| | AM1M-1205S-NZ only | 25 | | |

## Output Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Voltage accuracy | See tolerance envelope graph | | | |
| Short Circuit protection | 3.3Vin, 24Vin & 24Vout models | 1s | | |
| | Others | Continuous, Auto recovery | | |
| Line voltage regulation | For Vin change of 1% | | ±1.2 | % of Vin |
| | 3.3Vout models, For Vin change of 1% | | ±1.5 | |
| Load voltage regulation | 10% to 100% load | ±15 | | % |
| Temperature coefficient | Nominal input,100% full load | | ±0.03 | %/ºC |
| Ripple & Noise | 20MHz Bandwidth | 60 | 150 | mVp-p |

NOTE: It is not recommended to have the outputs connected in parallel

## General Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Switching frequency | 100% load | 100 | | KHz |
| | AM1M-0505S-NZ | 100 | 300 | |
| Operating temperature | Without derating up to 85ºC | -40 to +105 | | ºC |
| Storage temperature | -55 to +125 | | | ºC |
| Maximum case temperature | | | 100 | ºC |
| Cooling | Free Air Convection | | | |
| Humidity | | | 95 | % RH |
| Case material | Black flame-retardant heat-proof plastic (UL94-V0) | | | |
| Weight | 1.4*(Single output models)<br>2.4*(Dual output & 3000VDC isolation models) | | | g |
| Dimensions (L x W x H) | 0.77 x 0.28 x 0.18 inches, 19.50 x 6.60 x 4.50 mm (Single output models)<br>0.79 x 0.39 x 0.28 inches, 20.00 x 10.00 x 7.00 mm (Dual output & 3000VDC isolation models) | | | |
| MTBF | >3,500,000 hours (MIL-HDBK -217F, Ground Benign, t=+25ºC) | | | |
| Maximum Soldering Temperature | 1.5mm from case for 10 seconds | | 300 | ºC |

## Safety Specifications

| Parameters | | |
|---|---|---|
| Agency approvals | cULus (except models marked with *) | |
| Standards | Information technology Equipment | UL 60950-1 (AM1M-1515SH30-NZ only) |
| | EMI - Conducted and radiated emission | EN55022 Class B (see recommended circuit), |
| | Electrostatic Discharge Immunity | IEC61000-4-2, Perf. Criteria B (ESD Contact +/- 6KV) |

## Pin Out Specifications

| 1500VDC Isolation | |
|---|---|
| Pin | Single |
| 1 | +Vin |
| 2 | -Vin |
| 5 | -Vout |
| 6 | +Vout |
| 7 | NC |
| 8 | NC |
| 14 | NC |

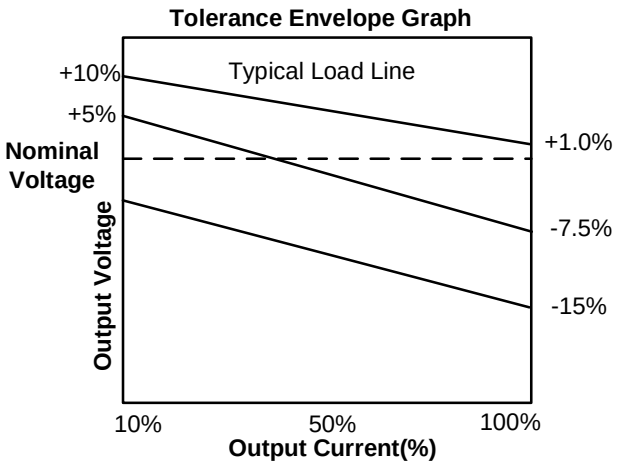
NC: not connected

| 1500VDC Isolation | |
|---|---|
| Pin | Dual |
| 1 | -Vin |
| 7 | NC |
| 8 | Common |
| 9 | +Vout |
| 11 | -Vout |
| 14 | +Vin |

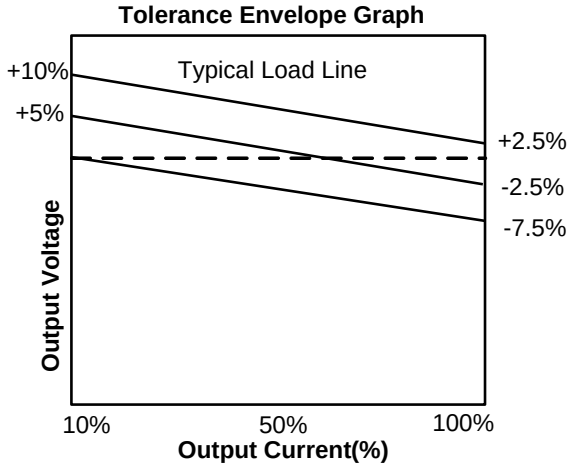
| | 3000VDC Isolation | |
|---|---|---|
| Pin | Single | Dual |
| 1 | -Vin | -Vin |
| 7 | NC | NC |
| 8 | +Vout | +Vout |
| 9 | No Pin | Common |
| 10 | -Vout | -Vout |
| 14 | +Vin | +Vin |

## Typical Characteristics

### 3.3V output models

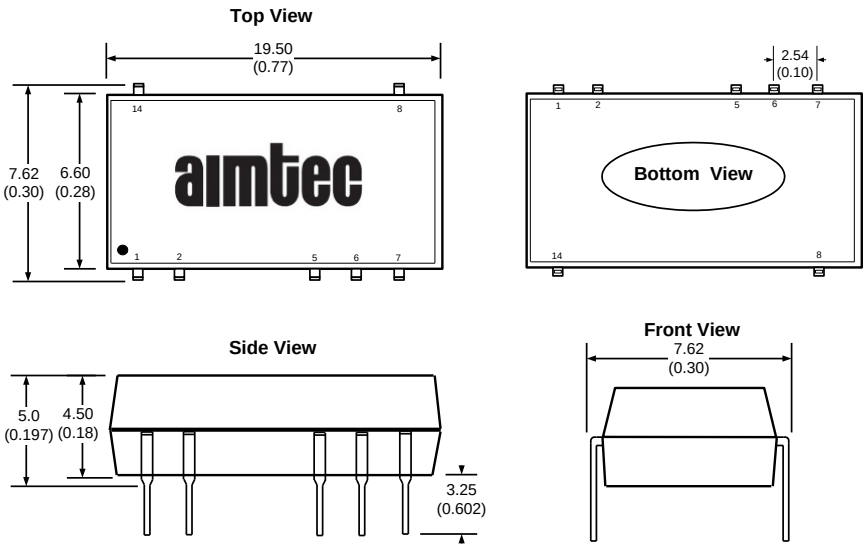



### Others

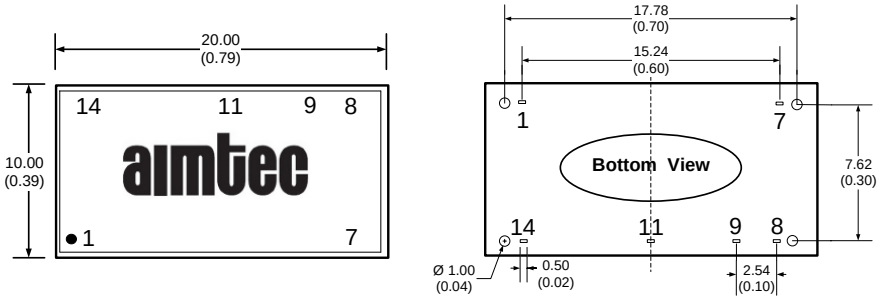


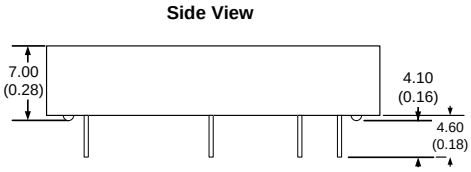

## Dimensions

### Single 1500VDC Isolated models



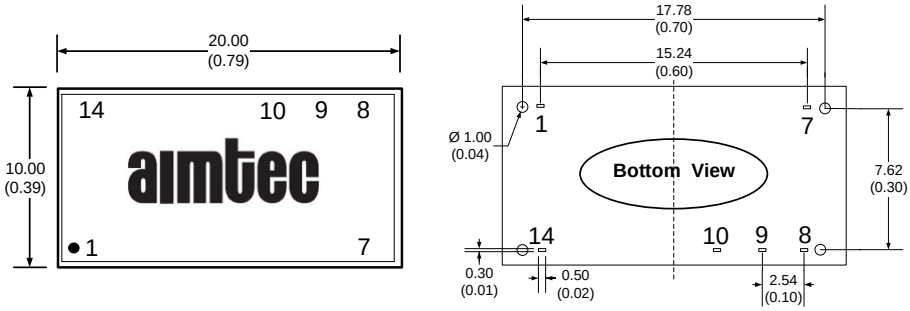
## Dual 1500VDC Isolated models

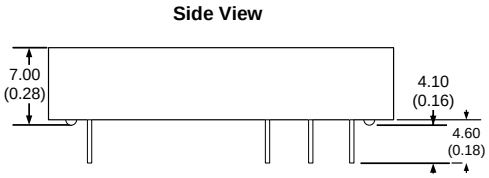



Dimensions are in mm (inch)
Pin Pitch Tolerance: ±0.10 mm (±0.004 inch)
Case Tolerance: ±0.25 mm (±0.01 inch)

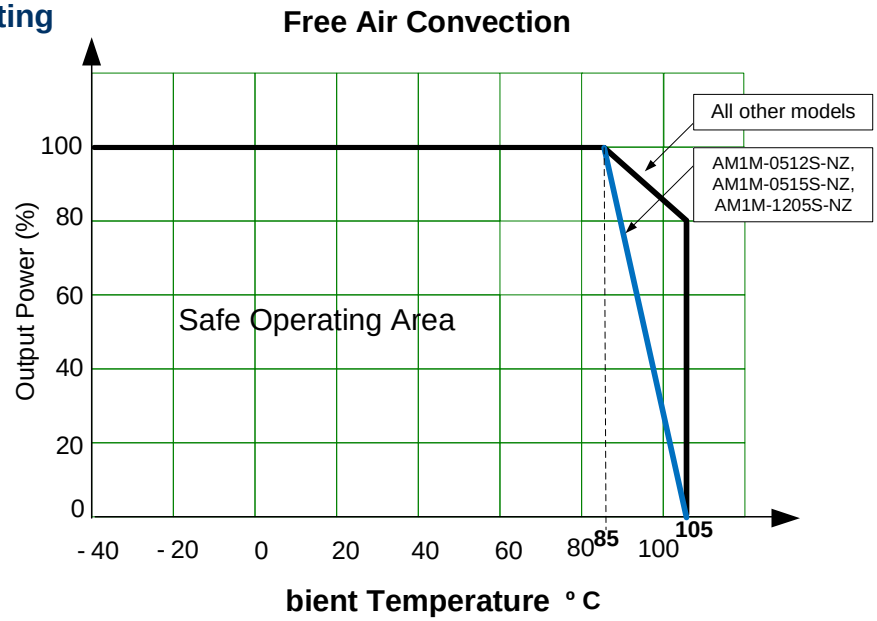
## 3000VDC Isolated models



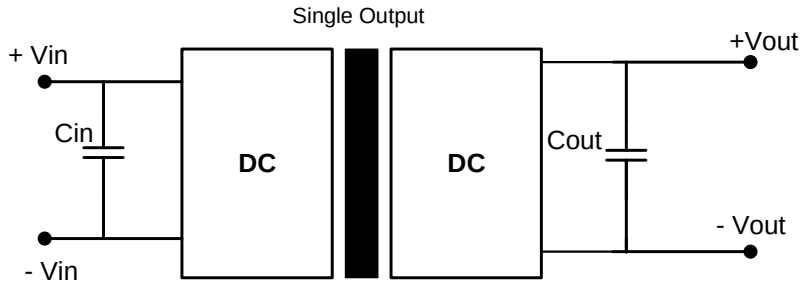




Dimensions are in mm (inch)
Pin Pitch Tolerance: ±0.10 mm (±0.004 inch)
Case Tolerance: ±0.25 mm (±0.01 inch)

## Derating

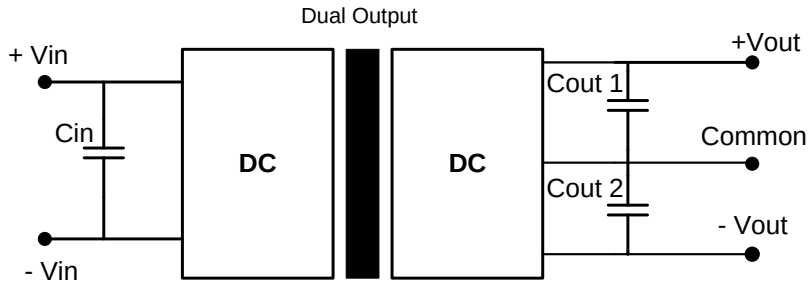


## Typical application circuit



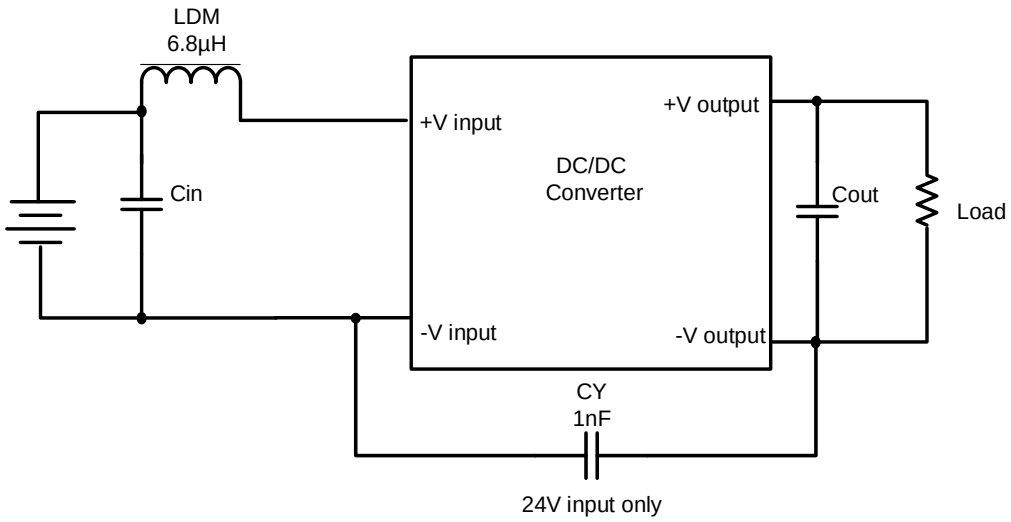

| Vin (VDC) | Cin (uF) | Vout (VDC) | Cout (uF) |
|---|---|---|---|
| 3.3/5 | 4.7 | 3.3/5 | 10 |
| 12/15 | 2.2 | 12 | 2.2 |
| 24 | 1 | 15 | 1 |

It is not recommended to connect any external capacitor in the application field when output loading is less than 0.5 watt.




| Vin (VDC) | Cin (uF) | Vout (VDC) | Cout 1 & 2 (uF) |
|---|---|---|---|
| 3.3/5 | 4.7 | ±5 | 4.7 |
| 12/15 | 2.2 | ±9/±12 | 1 |
| 24 | 1 | ±15/±24 | 0.47 |

## EMI Recommended Circuit (Class B)




NOTE: Cin and Cout values are the same as referenced in the Application Circuit.

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