

## Series AM5T-VZ

### 5 Watt | DC-DC Converter



#### FEATURES:

- Wide 2:1 input range
- 24 Pin DIP Package
- Metal package
- High efficiency up to 80%
- Operating temperature -40°C to + 85°C
- Input / Output isolation 1500 & 3500 VDC
- Pin compatible with multiple manufacturers
- Continuous short circuit protection



#### Models

##### Single output

| Model            | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Max. Capacitive load (μF) | Efficiency (%) |
|------------------|-------------------|--------------------|-------------------------|---------------------------|----------------|
| AM5T-1205S-VZ    | 9-18              | 5                  | 1000                    | 2200                      | 74             |
| AM5T-1209S-VZ    | 9-18              | 9                  | 555                     | 470                       | 77             |
| AM5T-1212S-VZ    | 9-18              | 12                 | 416                     | 470                       | 78             |
| AM5T-1215S-VZ    | 9-18              | 15                 | 333                     | 470                       | 78             |
| AM5T-1224S-VZ    | 9-18              | 24                 | 208                     | 220                       | 75             |
| AM5T-2405S-VZ    | 18-36             | 5                  | 1000                    | 2200                      | 75             |
| AM5T-2409S-VZ    | 18-36             | 9                  | 555                     | 470                       | 76             |
| AM5T-2412S-VZ    | 18-36             | 12                 | 416                     | 470                       | 77             |
| AM5T-2415S-VZ    | 18-36             | 15                 | 333                     | 470                       | 78             |
| AM5T-2424S-VZ    | 18-36             | 24                 | 208                     | 220                       | 76             |
| AM5T-4805S-VZ    | 36-72             | 5                  | 1000                    | 2200                      | 77             |
| AM5T-4809S-VZ    | 36-72             | 9                  | 555                     | 470                       | 78             |
| AM5T-4812S-VZ    | 36-72             | 12                 | 416                     | 470                       | 80             |
| AM5T-4815S-VZ    | 36-72             | 15                 | 333                     | 470                       | 80             |
| AM5T-4824S-VZ    | 36-72             | 24                 | 208                     | 220                       | 77             |
| AM5T-1205SH35-VZ | 9-18              | 5                  | 1000                    | 2200                      | 74             |
| AM5T-1209SH35-VZ | 9-18              | 9                  | 555                     | 470                       | 77             |
| AM5T-1212SH35-VZ | 9-18              | 12                 | 416                     | 470                       | 78             |
| AM5T-1215SH35-VZ | 9-18              | 15                 | 333                     | 470                       | 78             |
| AM5T-1224SH35-VZ | 9-18              | 24                 | 208                     | 220                       | 75             |
| AM5T-2405SH35-VZ | 18-36             | 5                  | 1000                    | 2200                      | 75             |
| AM5T-2409SH35-VZ | 18-36             | 9                  | 555                     | 470                       | 76             |
| AM5T-2412SH35-VZ | 18-36             | 12                 | 416                     | 470                       | 77             |
| AM5T-2415SH35-VZ | 18-36             | 15                 | 333                     | 470                       | 78             |
| AM5T-2424SH35-VZ | 18-36             | 24                 | 208                     | 220                       | 76             |
| AM5T-4805SH35-VZ | 36-72             | 5                  | 1000                    | 2200                      | 77             |
| AM5T-4809SH35-VZ | 36-72             | 9                  | 555                     | 470                       | 78             |
| AM5T-4812SH35-VZ | 36-72             | 12                 | 416                     | 470                       | 80             |
| AM5T-4815SH35-VZ | 36-72             | 15                 | 333                     | 470                       | 80             |
| AM5T-4824SH35-VZ | 36-72             | 24                 | 208                     | 220                       | 77             |

#### Models

##### Dual output

| Model         | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Max. Capacitive load (μF) | Efficiency (%) |
|---------------|-------------------|--------------------|-------------------------|---------------------------|----------------|
| AM5T-1205D-VZ | 9-18              | ±5                 | ±500                    | ±1000                     | 72             |
| AM5T-1209D-VZ | 9-18              | ±9                 | ±277                    | ±220                      | 76             |
| AM5T-1212D-VZ | 9-18              | ±12                | ±208                    | ±220                      | 77             |
| AM5T-1215D-VZ | 9-18              | ±15                | ±166                    | ±220                      | 77             |
| AM5T-1224D-VZ | 9-18              | ±24                | ±104                    | ±100                      | 76             |
| AM5T-2405D-VZ | 18-36             | ±5                 | ±500                    | ±1000                     | 74             |
| AM5T-2409D-VZ | 18-36             | ±9                 | ±277                    | ±220                      | 76             |
| AM5T-2412D-VZ | 18-36             | ±12                | ±208                    | ±220                      | 78             |
| AM5T-2415D-VZ | 18-36             | ±15                | ±166                    | ±220                      | 78             |
| AM5T-2424D-VZ | 18-36             | ±24                | ±104                    | ±100                      | 75             |
| AM5T-4805D-VZ | 36-72             | ±5                 | ±500                    | ±1000                     | 76             |

### Models

#### Dual output (continued)

| Model            | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Max. Capacitive load (μF) | Efficiency (%) |
|------------------|-------------------|--------------------|-------------------------|---------------------------|----------------|
| AM5T-4809D-VZ    | 36-72             | ±9                 | ±277                    | ±220                      | 78             |
| AM5T-4812D-VZ    | 36-72             | ±12                | ±208                    | ±220                      | 78             |
| AM5T-4815D-VZ    | 36-72             | ±15                | ±166                    | ±220                      | 80             |
| AM5T-4824D-VZ    | 36-72             | ±24                | ±104                    | ±100                      | 77             |
| AM5T-1205DH35-VZ | 9-18              | ±5                 | ±500                    | ±1000                     | 72             |
| AM5T-1209DH35-VZ | 9-18              | ±9                 | ±277                    | ±220                      | 76             |
| AM5T-1212DH35-VZ | 9-18              | ±12                | ±208                    | ±220                      | 77             |
| AM5T-1215DH35-VZ | 9-18              | ±15                | ±166                    | ±220                      | 77             |
| AM5T-1224DH35-VZ | 9-18              | ±24                | ±104                    | ±100                      | 76             |
| AM5T-2405DH35-VZ | 18-36             | ±5                 | ±500                    | ±1000                     | 74             |
| AM5T-2409DH35-VZ | 18-36             | ±9                 | ±277                    | ±220                      | 76             |
| AM5T-2412DH35-VZ | 18-36             | ±12                | ±208                    | ±220                      | 78             |
| AM5T-2415DH35-VZ | 18-36             | ±15                | ±166                    | ±220                      | 78             |
| AM5T-2424DH35-VZ | 18-36             | ±24                | ±104                    | ±100                      | 75             |
| AM5T-4805DH35-VZ | 36-72             | ±5                 | ±500                    | ±1000                     | 76             |
| AM5T-4809DH35-VZ | 36-72             | ±9                 | ±277                    | ±220                      | 78             |
| AM5T-4812DH35-VZ | 36-72             | ±12                | ±208                    | ±220                      | 78             |
| AM5T-4815DH35-VZ | 36-72             | ±15                | ±166                    | ±220                      | 80             |
| AM5T-4824DH35-VZ | 36-72             | ±24                | ±104                    | ±100                      | 77             |

### Input Specifications

| Parameters              | Nominal            | Typical | Maximum | Units |
|-------------------------|--------------------|---------|---------|-------|
| Voltage Range           | 12                 | 9-18    |         | VDC   |
|                         | 24                 | 18-36   |         | VDC   |
|                         | 48                 | 36-72   |         | VDC   |
| Filter                  | $\pi$ (Pi) Network |         |         |       |
| Start up time           |                    | 20      |         | ms    |
| Absolute Maximum Rating | 12 Vin             | -0.7-24 |         | VDC   |
|                         | 24 Vin             | -0.7-40 |         | VDC   |
|                         | 48 Vin             | -0.7-80 |         | VDC   |
| Peak Input Voltage time |                    |         | 100     | ms    |

### Isolation Specifications

| Parameters         | Conditions         | Typical | Rated | Units |
|--------------------|--------------------|---------|-------|-------|
| Tested I/O voltage | 60 sec             |         | 1500  | VDC   |
|                    | 60 sec, H35 models |         | 3500  | VDC   |
| Resistance         |                    | > 1000  |       | MOhm  |
| Capacitance        |                    | 60      |       | pF    |

### Output Specifications

| Parameters                | Conditions         | Typical | Maximum | Units  |
|---------------------------|--------------------|---------|---------|--------|
| Voltage accuracy          |                    | ±1      |         | %      |
| Voltage balance           | Balanced Load      | ±1      |         | %      |
| Short circuit protection  | Continuous         |         |         |        |
| Short circuit restart     | Auto Recovery      |         |         |        |
| Line voltage regulation   | HL-LL              | ±0.5    |         | %      |
| Load voltage regulation   | 25-100% Load       | ±0.5    |         | %      |
| Temperature coefficient   |                    | ±0.02   |         | %/°C   |
| Ripple & Noise (see note) | At 20MHz Bandwidth | 60      |         | mV p-p |

Note: For ripple and noise specification, a 100 μF capacitor must be placed on the output of converter.

## General Specifications

| Parameters            | Conditions                                                               | Typical                 | Maximum                  | Units |
|-----------------------|--------------------------------------------------------------------------|-------------------------|--------------------------|-------|
| Switching frequency   |                                                                          | 100-400                 |                          | KHz   |
| Operating temperature | Full Load (see derating chart)                                           | -40 to +85              |                          | °C    |
| Storage temperature   |                                                                          | -40 to +125             |                          | °C    |
| Derating              | 71 to 85 °C                                                              | 3.45                    |                          | %/ °C |
| Max Case temperature  |                                                                          |                         | 100                      | °C    |
| Cooling               | Free air convection                                                      |                         |                          |       |
| Humidity              |                                                                          |                         | 95                       | %     |
| Case material         | Nickel coated copper                                                     |                         |                          |       |
| Weight                |                                                                          | 17                      |                          | g     |
| Dimensions(L x W x H) | Tolerance $\pm 0.5$ mm or $\pm 0.02$ inches                              | 1.25 x 0.8 x 0.4 inches | 31.75 x 20.32 x 10.16 mm |       |
| MTBF                  | >1,000,000 hrs (MIL-HDBK -217F, Ground Benign, $t=+25^{\circ}\text{C}$ ) |                         |                          |       |

## Safety Specifications

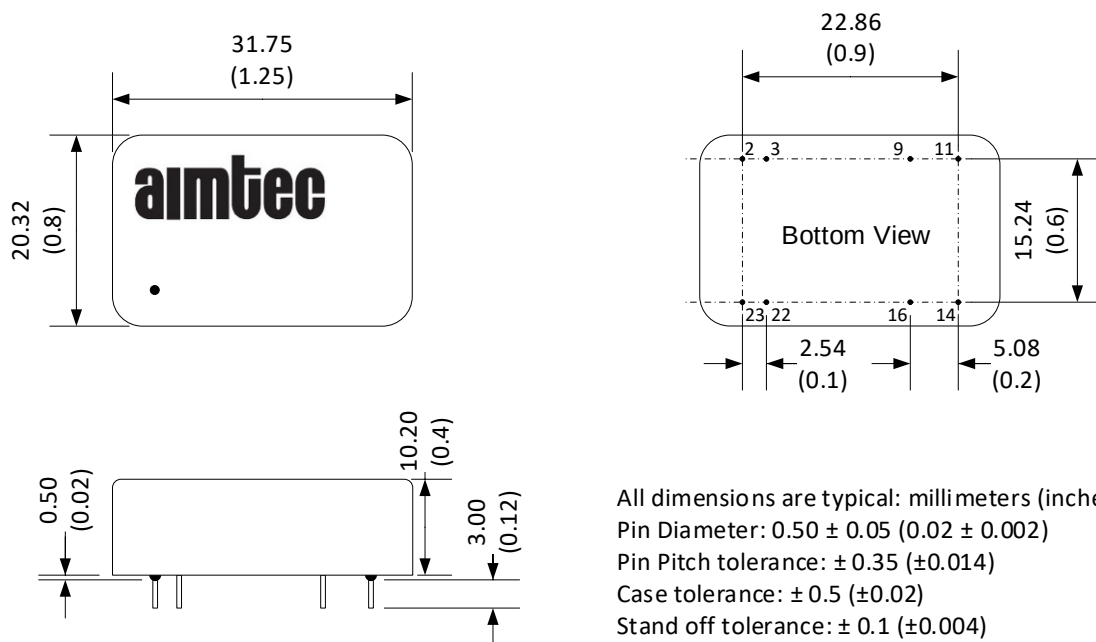
| Parameters |                              |
|------------|------------------------------|
| Standards  | Designed to meet IEC 60950-1 |

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.

## Pin Out Specifications

| Pin | 1500 and 3500VDC |           |
|-----|------------------|-----------|
|     | Single           | Dual      |
| 2   | -V Input         | -V Input  |
| 3   | -V Input         | -V Input  |
| 9   | No pin           | Common    |
| 11  | N.C.             | -V Output |
| 14  | +V Output        | +V Output |
| 16  | -V Output        | Common    |
| 22  | +V Input         | +V Input  |
| 23  | +V Input         | +V Input  |

## Dimensions



All dimensions are typical: millimeters (inches)

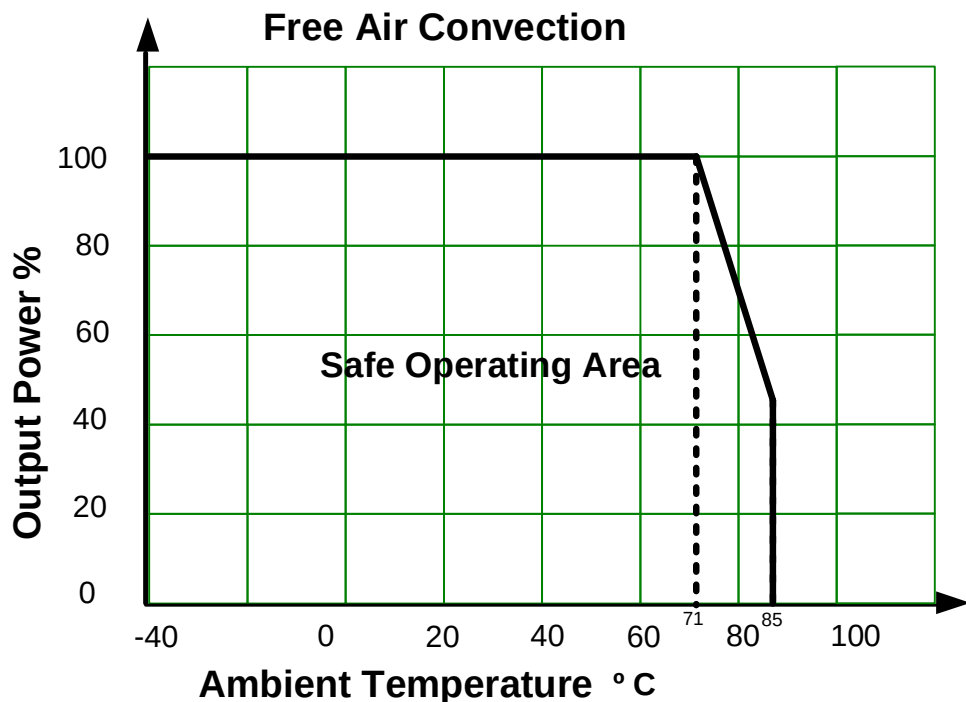
Pin Diameter:  $0.50 \pm 0.05$  ( $0.02 \pm 0.002$ )

Pin Pitch tolerance:  $\pm 0.35$  ( $\pm 0.014$ )

Case tolerance:  $\pm 0.5$  ( $\pm 0.02$ )

Stand off tolerance:  $\pm 0.1$  ( $\pm 0.004$ )

## Derating



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