

## Series AM5TW-Z

### 5 Watt | DC-DC Converter



#### FEATURES:

- RoHS compliant
- 24 Pin DIP Package
- High efficiency up to 84%
- Wide 4:1 input range
- Operating temperature -40°C to + 85°C
- Input / Output isolation 1500 or 3500VDC
- Pin compatible with multiple manufacturers
- Continuous short circuit protection

#### Models

##### Single output



| Model           | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Capacitive Load (uF) | Efficiency (%) |
|-----------------|-------------------|--------------------|-------------------------|-----------------|--------------------------|----------------|
| AM5TW-2403SZ    | 9-36              | 3.3                | 1300                    | 1500            | 1000                     | 75             |
| AM5TW-2405SZ    | 9-36              | 5                  | 1000                    | 1500            | 1000                     | 80             |
| AM5TW-2407SZ    | 9-36              | 7.2                | 690                     | 1500            | 470                      | 78             |
| AM5TW-2409SZ    | 9-36              | 9                  | 550                     | 1500            | 470                      | 80             |
| AM5TW-2412SZ    | 9-36              | 12                 | 410                     | 1500            | 220                      | 81             |
| AM5TW-2415SZ    | 9-36              | 15                 | 330                     | 1500            | 68                       | 84             |
| AM5TW-2418SZ    | 9-36              | 18                 | 270                     | 1500            | 68                       | 82             |
| AM5TW-2424SZ    | 9-36              | 24                 | 200                     | 1500            | 68                       | 82             |
| AM5TW-4803SZ    | 18-72             | 3.3                | 1300                    | 1500            | 1000                     | 75             |
| AM5TW-4805SZ    | 18-72             | 5                  | 1000                    | 1500            | 1000                     | 81             |
| AM5TW-4807SZ    | 18-72             | 7.2                | 690                     | 1500            | 470                      | 80             |
| AM5TW-4809SZ    | 18-72             | 9                  | 550                     | 1500            | 470                      | 82             |
| AM5TW-4812SZ    | 18-72             | 12                 | 410                     | 1500            | 220                      | 83             |
| AM5TW-4815SZ    | 18-72             | 15                 | 330                     | 1500            | 68                       | 84             |
| AM5TW-4818SZ    | 18-72             | 18                 | 270                     | 1500            | 68                       | 83             |
| AM5TW-4824SZ    | 18-72             | 24                 | 200                     | 1500            | 68                       | 83             |
| AM5TW-2403SH35Z | 9-36              | 3.3                | 1300                    | 3500            | 1000                     | 75             |
| AM5TW-2405SH35Z | 9-36              | 5                  | 1000                    | 3500            | 1000                     | 80             |
| AM5TW-2407SH35Z | 9-36              | 7.2                | 690                     | 3500            | 470                      | 78             |
| AM5TW-2409SH35Z | 9-36              | 9                  | 550                     | 3500            | 470                      | 80             |
| AM5TW-2412SH35Z | 9-36              | 12                 | 410                     | 3500            | 220                      | 81             |
| AM5TW-2415SH35Z | 9-36              | 15                 | 330                     | 3500            | 68                       | 84             |
| AM5TW-2418SH35Z | 9-36              | 18                 | 270                     | 3500            | 68                       | 82             |
| AM5TW-2424SH35Z | 9-36              | 24                 | 200                     | 3500            | 68                       | 82             |
| AM5TW-4803SH35Z | 18-72             | 3.3                | 1300                    | 3500            | 1000                     | 75             |
| AM5TW-4805SH35Z | 18-72             | 5                  | 1000                    | 3500            | 1000                     | 81             |
| AM5TW-4807SH35Z | 18-72             | 7.2                | 690                     | 3500            | 470                      | 80             |
| AM5TW-4809SH35Z | 18-72             | 9                  | 550                     | 3500            | 470                      | 82             |
| AM5TW-4812SH35Z | 18-72             | 12                 | 410                     | 3500            | 220                      | 83             |
| AM5TW-4815SH35Z | 18-72             | 15                 | 330                     | 3500            | 68                       | 84             |
| AM5TW-4818SH35Z | 18-72             | 18                 | 270                     | 3500            | 68                       | 83             |
| AM5TW-4824SH35Z | 18-72             | 24                 | 200                     | 3500            | 68                       | 83             |

#### Models

##### Dual output

| Model        | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Capacitive Load (uF) | Efficiency (%) |
|--------------|-------------------|--------------------|-------------------------|-----------------|--------------------------|----------------|
| AM5TW-2403DZ | 9-36              | ±3.3               | ±600                    | 1500            | ±100                     | 79             |
| AM5TW-2405DZ | 9-36              | ±5                 | ±500                    | 1500            | ±100                     | 81             |
| AM5TW-2407DZ | 9-36              | ±7.2               | ±347                    | 1500            | ±100                     | 80             |
| AM5TW-2409DZ | 9-36              | ±9                 | ±278                    | 1500            | ±100                     | 82             |
| AM5TW-2412DZ | 9-36              | ±12                | ±209                    | 1500            | ±68                      | 83             |
| AM5TW-2415DZ | 9-36              | ±15                | ±167                    | 1500            | ±22                      | 83             |
| AM5TW-2418DZ | 9-36              | ±18                | ±139                    | 1500            | ±22                      | 83             |
| AM5TW-2424DZ | 9-36              | ±24                | ±104                    | 1500            | ±22                      | 83             |

## Models

### Dual output (continued)

| Model           | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Capacitive Load (uF) | Efficiency (%) |
|-----------------|-------------------|--------------------|-------------------------|-----------------|--------------------------|----------------|
| AM5TW-4803DZ    | 18-72             | ±3.3               | ±600                    | 1500            | ±100                     | 80             |
| AM5TW-4805DZ    | 18-72             | ±5                 | ±500                    | 1500            | ±100                     | 81             |
| AM5TW-4807DZ    | 18-72             | ±7.2               | ±347                    | 1500            | ±100                     | 80             |
| AM5TW-4809DZ    | 18-72             | ±9                 | ±278                    | 1500            | ±100                     | 82             |
| AM5TW-4812DZ    | 18-72             | ±12                | ±209                    | 1500            | ±68                      | 82             |
| AM5TW-4815DZ    | 18-72             | ±15                | ±167                    | 1500            | ±22                      | 83             |
| AM5TW-4818DZ    | 18-72             | ±18                | ±139                    | 1500            | ±22                      | 82             |
| AM5TW-4824DZ    | 18-72             | ±24                | ±104                    | 1500            | ±22                      | 82             |
| AM5TW-2403DH35Z | 9-36              | ±3.3               | ±600                    | 3500            | ±100                     | 79             |
| AM5TW-2405DH35Z | 9-36              | ±5                 | ±500                    | 3500            | ±100                     | 81             |
| AM5TW-2407DH35Z | 9-36              | ±7.2               | ±347                    | 3500            | ±100                     | 80             |
| AM5TW-2409DH35Z | 9-36              | ±9                 | ±278                    | 3500            | ±100                     | 82             |
| AM5TW-2412DH35Z | 9-36              | ±12                | ±209                    | 3500            | ±68                      | 83             |
| AM5TW-2415DH35Z | 9-36              | ±15                | ±167                    | 3500            | ±22                      | 83             |
| AM5TW-2418DH35Z | 9-36              | ±18                | ±139                    | 3500            | ±22                      | 83             |
| AM5TW-2424DH35Z | 9-36              | ±24                | ±104                    | 3500            | ±22                      | 83             |
| AM5TW-4803DH35Z | 18-72             | ±3.3               | ±600                    | 3500            | ±100                     | 80             |
| AM5TW-4805DH35Z | 18-72             | ±5                 | ±500                    | 3500            | ±100                     | 81             |
| AM5TW-4807DH35Z | 18-72             | ±7.2               | ±347                    | 3500            | ±100                     | 80             |
| AM5TW-4809DH35Z | 18-72             | ±9                 | ±278                    | 3500            | ±100                     | 82             |
| AM5TW-4812DH35Z | 18-72             | ±12                | ±209                    | 3500            | ±68                      | 82             |
| AM5TW-4815DH35Z | 18-72             | ±15                | ±167                    | 3500            | ±22                      | 83             |
| AM5TW-4818DH35Z | 18-72             | ±18                | ±139                    | 3500            | ±22                      | 82             |
| AM5TW-4824DH35Z | 18-72             | ±24                | ±104                    | 3500            | ±22                      | 82             |

## Input Specifications

| Parameters                     | Nominal            | Typical            | Maximum | Units |
|--------------------------------|--------------------|--------------------|---------|-------|
| Voltage range                  | 24<br>48           | 9-36<br>18-72      |         | VDC   |
| Filter                         | $\pi$ (Pi) Network |                    |         |       |
| Turn on Transient process time |                    |                    | 350     | ms    |
| Start up time                  |                    | 500                |         | ms    |
| Absolute Maximum Rating        | 24 Vin<br>48 Vin   | -0.7-40<br>-0.7-80 |         | VDC   |
| Peak Input Voltage time        |                    |                    | 100     | ms    |

## Isolation Specifications

| Parameters         | Conditions | Typical | Rated        | Units |
|--------------------|------------|---------|--------------|-------|
| Tested I/O voltage | 3 sec      |         | 1500 or 3500 | VDC   |
| Resistance         |            | > 1000  |              | MOhm  |
| Capacitance        |            | 470     |              | pF    |

## Output Specifications

| Parameters                       | Conditions    | Typical   | Maximum | Units |
|----------------------------------|---------------|-----------|---------|-------|
| Voltage accuracy                 |               | ±1        |         | %     |
| Voltage balance                  | Dual Output   | ±1        |         | %     |
| Short Circuit protection         | Continuous    |           |         |       |
| Short circuit restart            | Auto recovery |           |         |       |
| Over current protection          |               | 120% Iout |         |       |
| Line voltage regulation (Single) |               | ±0.5      |         | %     |
| Line voltage regulation (Dual)   |               | ±0.5      |         | %     |
| Load voltage regulation (Single) | 0 – 100% load | ±0.5      |         | %     |
| Load voltage regulation (Single) | 0 – 100% load | ±1.5      |         | %     |
| 3.3V output model                |               |           |         |       |

## Output Specifications (continued)

| Parameters                                           | Conditions         | Typical | Maximum | Units    |
|------------------------------------------------------|--------------------|---------|---------|----------|
| Load voltage regulation (Dual)                       | 0 – 100% load      | ±0.5    |         | %        |
| Load voltage regulation (Dual)<br>±3.3V output model |                    | ±1.5    |         | %        |
| Temperature coefficient                              |                    | ±0.02   |         | %/°C     |
| Ripple & Noise                                       | At 20MHz Bandwidth | 60      |         | mV p-p   |
| Rising time                                          |                    | 10      |         | ms       |
| Minimum Load Current                                 |                    | 0       |         | % of Max |

## General Specifications

| Parameters            | Conditions                                            | Typical                   | Maximum                  | Units |
|-----------------------|-------------------------------------------------------|---------------------------|--------------------------|-------|
| Switching frequency   | 100% load                                             | 260                       |                          | KHz   |
| Operating temperature | Full Load without Derating                            | -40 to +85                |                          | °C    |
| Storage temperature   |                                                       | -40 to +125               |                          | °C    |
| Max Case temperature  |                                                       |                           | 100                      | °C    |
| Derating              | Non-Required                                          |                           |                          |       |
| Cooling               | Free air convection                                   |                           |                          |       |
| Humidity              |                                                       |                           | 90                       | %     |
| Case material         | Nickel coated copper                                  |                           |                          |       |
| Weight                |                                                       | 26                        |                          | g     |
| Dimensions(L x W x H) | Tolerance ±0.5 mm or ±0.02 inches                     | 1.28 x 0.84 x 0.41 inches | 32.25 x 21.35 x 10.50 mm |       |
| MTBF                  | >960 000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C) |                           |                          |       |

NOTE: All specifications noted 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.

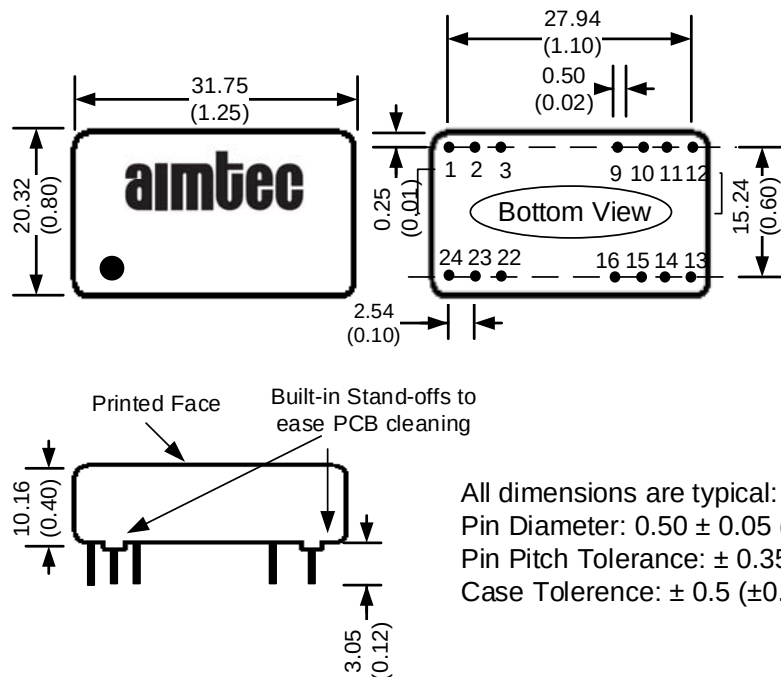
## Safety Specifications

| Parameters      |                                                                   |
|-----------------|-------------------------------------------------------------------|
| Agency Approval | CE                                                                |
| Standards       | EN55022 Class A, EN55024                                          |
|                 | IEC61000-4-2, Perf. Criteria B                                    |
|                 | IEC61000-4-3, Perf. Criteria A                                    |
|                 | IEC61000-4-4, Perf. Criteria B (external 220uF/100V cap required) |
|                 | IEC61000-4-5, Perf. Criteria B (external 220uF/100V cap required) |
|                 | IEC61000-4-6, Perf. Criteria A                                    |
|                 | IEC61000-4-8, Perf. Criteria A                                    |
|                 | NOTE: Also designed to meet IEC60950-1:2001                       |

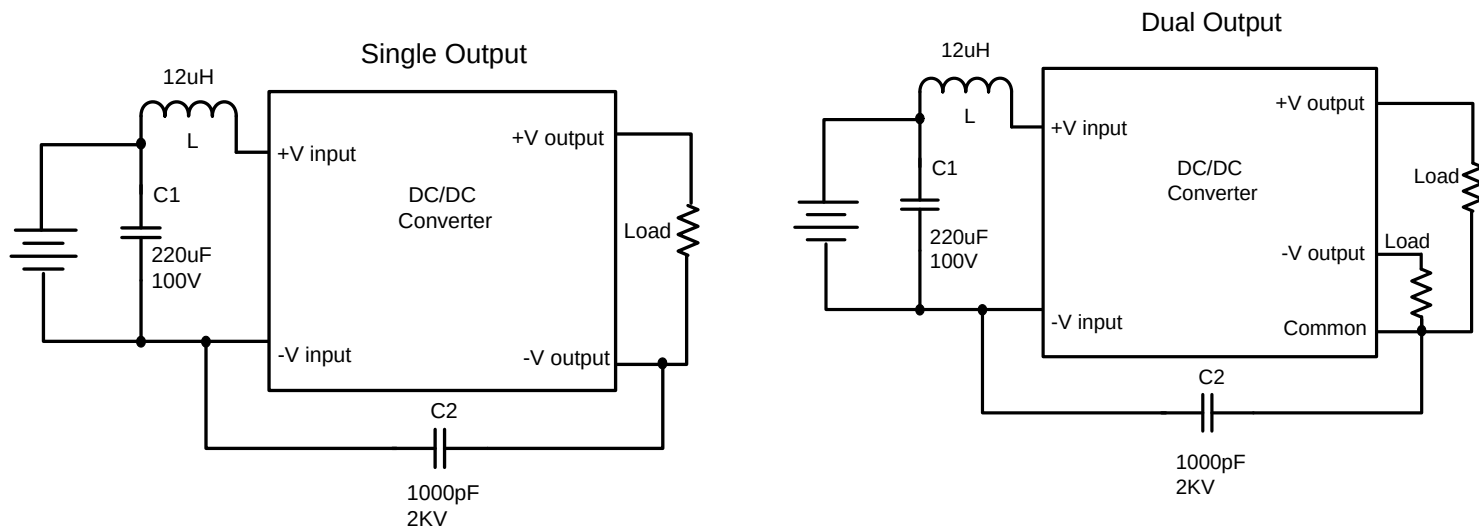
## Pin Out Specifications

| Pin   | 1500VDC   |           | 3500VDC   |           |
|-------|-----------|-----------|-----------|-----------|
|       | Single    | Dual      | Single    | Dual      |
| 1     | +V Input  | +V Input  | Omitted   | Omitted   |
| 2     | N. C.     | -V Output | -V Input  | -V Input  |
| 3     | N. C.     | Common    | -V Input  | -V Input  |
| 9     | Omitted   | Omitted   | Omitted   | Common    |
| 10    | -V Output | Common    | Omitted   | Omitted   |
| 11    | +V Output | +V Output | N.C.      | -V Output |
| 12/13 | -V Input  | -V Input  | Omitted   | Omitted   |
| 14    | +V Output | +V Output | +V Output | +V Output |
| 15    | -V Output | Common    | Omitted   | Omitted   |
| 16    | Omitted   | Omitted   | -V Output | Common    |
| 22    | N. C.     | Common    | +V Input  | +V Input  |
| 23    | N. C.     | -V Output | +V Input  | +V Input  |
| 24    | +V Input  | +V Input  | Omitted   | Omitted   |

## Dimensions

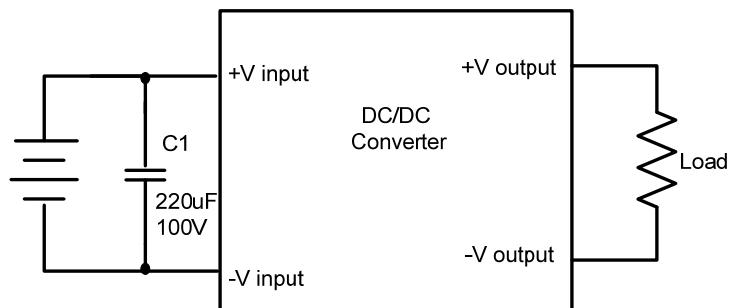


## Conducted Emissions:

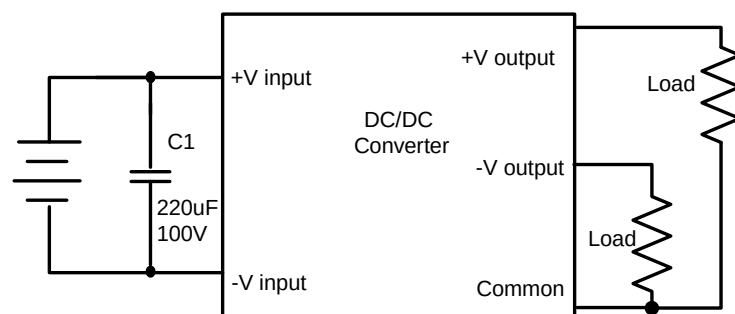


### Surge:

Single Output



Dual Output



**NOTE:** 1. Datasheets are updated as needed and as such, specifications are subject to change without notice. Once printed or downloaded, datasheets are no longer controlled by Aimtec; refer to [www.aimtec.com](http://www.aimtec.com) for the most current product specifications. 2. Product labels shown, including safety agency certifications on labels, may vary based on the date manufactured. 3. Mechanical drawings and specifications are for reference only. 4. All specifications are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. 5. Aimtec may not have conducted destructive testing or chemical analysis on all internal components and chemicals at the time of publishing this document. CAS numbers and other limited information are considered proprietary and may not be available for release. 6. This product is not designed for use in critical life support systems, equipment used in hazardous environments, nuclear control systems or other such applications which necessitate specific safety and regulatory standards other the ones listed in this datasheet. 7. Warranty is in accordance with Aimtec's standard Terms of Sale available at [www.aimtec.com](http://www.aimtec.com).