

## Series AM1A-Z

### 1 Watt | DC-DC Converter

#### FEATURES:



- RoHS compliant
- Regulated output voltage
- Low ripple and noise
- High efficiency up to 81%
- No Minimum Load Required
- Operating temperature -40°C to + 85°C
- Input / Output Isolation 1500 VDC
- Pin compatible with multiple manufacturers
- 6 pin SIP package
- Wide 2:1 Input Range



#### Models Single output

| Model       | Input Voltage (VDC) | Low line Input current FL (mA) | Input Current FL   No Load (mA) |    | Output Voltage (VDC) | Output Current (mA) | Isolation (VDC) | Max Capacitive Load (uF) | Efficiency (Full load) (%) |
|-------------|---------------------|--------------------------------|---------------------------------|----|----------------------|---------------------|-----------------|--------------------------|----------------------------|
| AM1A-0505SZ | 4.5 - 9             | 289                            | 263                             | 35 | 5                    | 200                 | 1500            | 1680                     | 76                         |
| AM1A-0512SZ | 4.5 - 9             | 278                            | 253                             | 35 | 12                   | 83                  | 1500            | 820                      | 79                         |
| AM1A-0515SZ | 4.5 - 9             | 275                            | 250                             | 35 | 15                   | 67                  | 1500            | 680                      | 80                         |
| AM1A-0524SZ | 4.5 - 9             | 275                            | 250                             | 35 | 24                   | 42                  | 1500            | 470                      | 80                         |
| AM1A-1205SZ | 9 - 18              | 141                            | 107                             | 20 | 5                    | 200                 | 1500            | 1680                     | 78                         |
| AM1A-1212SZ | 9 - 18              | 138                            | 105                             | 20 | 12                   | 83                  | 1500            | 820                      | 80                         |
| AM1A-1215SZ | 9 - 18              | 136                            | 103                             | 20 | 15                   | 67                  | 1500            | 680                      | 81                         |
| AM1A-1224SZ | 9 - 18              | 138                            | 105                             | 20 | 24                   | 42                  | 1500            | 470                      | 80                         |
| AM1A-2405SZ | 18 - 36             | 71                             | 54                              | 10 | 5                    | 200                 | 1500            | 1680                     | 78                         |
| AM1A-2412SZ | 18 - 36             | 68                             | 52                              | 10 | 12                   | 83                  | 1500            | 820                      | 80                         |
| AM1A-2415SZ | 18 - 36             | 69                             | 52                              | 10 | 15                   | 67                  | 1500            | 680                      | 80                         |
| AM1A-2424SZ | 18 - 36             | 68                             | 52                              | 10 | 24                   | 42                  | 1500            | 470                      | 81                         |
| AM1A-4805SZ | 36 - 75             | 36                             | 28                              | 7  | 5                    | 200                 | 1500            | 1680                     | 76                         |
| AM1A-4812SZ | 36 - 75             | 35                             | 27                              | 7  | 12                   | 83                  | 1500            | 820                      | 78                         |
| AM1A-4815SZ | 36 - 75             | 34                             | 27                              | 7  | 15                   | 67                  | 1500            | 680                      | 78                         |
| AM1A-4824SZ | 36 - 75             | 34                             | 27                              | 7  | 24                   | 42                  | 1500            | 470                      | 77                         |

FL= Full Load

#### Models Dual output

| Model       | Input Voltage (VDC) | Low line Input current FL (mA) | Input Current FL   No Load (mA) |    | Output Voltage (VDC) | Output Current (mA) | Isolation (VDC) | Max Capacitive Load (uF) | Efficiency (Full load) (%) |
|-------------|---------------------|--------------------------------|---------------------------------|----|----------------------|---------------------|-----------------|--------------------------|----------------------------|
| AM1A-0512DZ | 4.5 - 9             | 285                            | 259                             | 35 | ±12                  | ±42                 | 1500            | ±470                     | 77                         |
| AM1A-0515DZ | 4.5 - 9             | 282                            | 254                             | 35 | ±15                  | ±33                 | 1500            | ±330                     | 79                         |
| AM1A-1212DZ | 9 - 18              | 138                            | 106                             | 20 | ±12                  | ±42                 | 1500            | ±470                     | 79                         |
| AM1A-1215DZ | 9 - 18              | 138                            | 105                             | 20 | ±15                  | ±33                 | 1500            | ±330                     | 80                         |
| AM1A-2412DZ | 18 - 36             | 69                             | 52                              | 10 | ±12                  | ±42                 | 1500            | ±470                     | 80                         |
| AM1A-2415DZ | 18 - 36             | 70                             | 53                              | 10 | ±15                  | ±33                 | 1500            | ±330                     | 79                         |
| AM1A-4812DZ | 36 - 75             | 34                             | 27                              | 7  | ±12                  | ±42                 | 1500            | ±470                     | 77                         |
| AM1A-4815DZ | 36 - 75             | 35                             | 27                              | 7  | ±15                  | ±33                 | 1500            | ±330                     | 77                         |

FL= Full Load

#### Input Specifications

| Parameters                     | Nominal   | Typical | Maximum | Units |
|--------------------------------|-----------|---------|---------|-------|
| Voltage range                  | 5         | 4.5 – 9 |         | VDC   |
|                                | 12        | 9 - 18  |         |       |
|                                | 15        | 18 - 36 |         |       |
|                                | 24        | 36 - 75 |         |       |
| Filter                         | Capacitor |         |         |       |
| Turn on Transient process time |           | 1       |         | ms    |
| Startup time                   |           | 50      |         | ms    |
| Absolute Maximum Rating        | 5 Vin     | 0-15    |         | VDC   |
|                                | 12 Vin    | 0-25    |         |       |
|                                | 15 Vin    | 0-50    |         |       |
|                                | 24 Vin    | 0-100   |         |       |

|                                |                         |     |  |          |
|--------------------------------|-------------------------|-----|--|----------|
| Peak Input Voltage time        |                         | 100 |  | ms       |
| Input Reflected Ripple Current | See application circuit | 35  |  | mA pk-pk |
| Transient Recovery time        | 25% load step change    | 500 |  | μs       |
| Transient Response Deviation   | 25% load step change    | ±3  |  | %        |

## Isolation Specifications

| Parameters         | Conditions | Typical | Rated | Units |
|--------------------|------------|---------|-------|-------|
| Tested I/O voltage | 60 sec     |         | 1500  | VDC   |
| Resistance         |            | > 1000  |       | MOhm  |
| Capacitance        |            | 70      |       | pF    |

## Output Specifications

| Parameters                       | Conditions                       | Typical | Maximum | Units  |
|----------------------------------|----------------------------------|---------|---------|--------|
| Voltage accuracy                 |                                  | ±2      |         | %      |
| Short Circuit protection         | Continuous with auto recovery    |         |         |        |
| Line voltage regulation (Single) |                                  | ±0.2    |         | %      |
| Load voltage regulation (Single) | 0% to 100% load                  | ±1.0    |         | %      |
| Load voltage regulation (Dual)   | 0% to 100% load                  | ±2.0    |         | %      |
| Cross Regulation (Dual)          | 25% to 100% coupled to full load | ±5      |         | %      |
| Temperature coefficient          |                                  | ±0.02   |         | %/°C   |
| Ripple & Noise*                  | At 20MHz Bandwidth               | 50      |         | mV p-p |

\*Measured with a 1μF ceramic capacitor.

## General Specifications

| Parameters             | Conditions                                              | Typical                 | Maximum               | Units |
|------------------------|---------------------------------------------------------|-------------------------|-----------------------|-------|
| Switching frequency    | 100% load                                               | 150 - 550               |                       | KHz   |
| Max Case temperature   |                                                         |                         | +105                  | °C    |
| Operating temperature  | Full Load without Derating                              | -40 to +85              |                       | °C    |
| Storage temperature    |                                                         | -55 to +125             |                       | °C    |
| Derating               | Not Required                                            |                         |                       |       |
| Cooling                | Free air convection                                     |                         |                       |       |
| Humidity               |                                                         |                         | 95                    | %     |
| Case material          | Non conductive black plastic                            |                         |                       |       |
| Weight                 |                                                         | 3.0                     |                       | g     |
| Dimensions (L x W x H) |                                                         | 0.67 x 0.30 x 0.43 inch | 17.0 x 7.62 x 11.0 mm |       |
| MTBF                   | >2,800,000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C) |                         |                       |       |

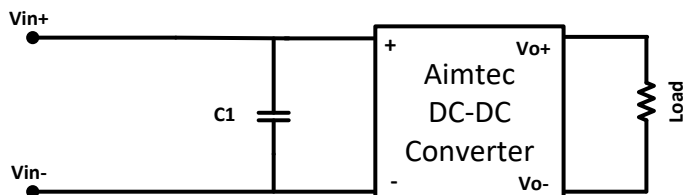
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified

## Safety Specifications

| Parameters                        |                                                                                                                                                                                                                                    |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Agency Approval & Safety Standard | CE, UL<br>UL60950-1, UL62368-1<br>EN 55032, Class A (external reference circuit below)<br>IEC 61000-4-2: 2008<br>IEC 61000-4-3: 2010<br>IEC 61000-4-4: 2012*<br>IEC 61000-4-5: 2005*<br>IEC 61000-4-6: 2008<br>IEC 61000-4-8: 2009 |

\*External filter capacitor for 5Vin 330μF/100V EEC & all other models 220μF/100V EEC

## Recommended Surge Protective Circuit

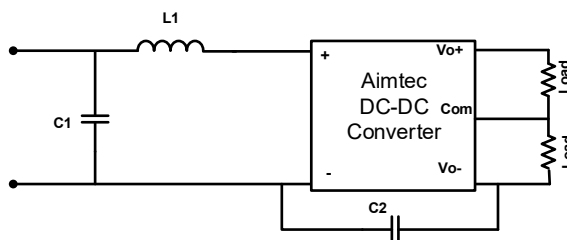
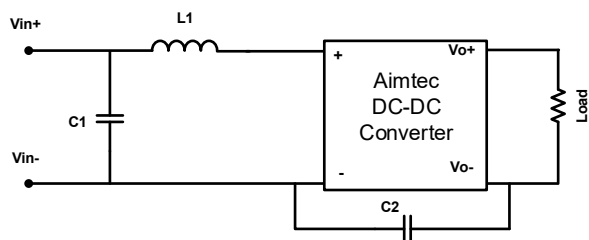


C1: 5V input models = 330  $\mu$ F / 100V, all other models = 220  $\mu$ F / 100V

## Recommended Circuits for Conducted Emissions

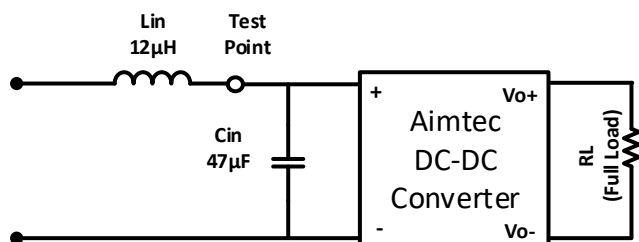
Single Output

Dual Output



| Model  | C1                      | L1          | C2               |
|--------|-------------------------|-------------|------------------|
| 5 Vin  | MLCC 4.7 $\mu$ F / 50V  | 4.7 $\mu$ H | MLCC 220pF / 3kV |
| 12 Vin | MLCC 4.7 $\mu$ F / 50V  | 4.7 $\mu$ H | MLCC 220pF / 3kV |
| 24 Vin | MLCC 4.7 $\mu$ F / 50V  | 18 $\mu$ H  | MLCC 220pF / 3kV |
| 48 Vin | MLCC 4.7 $\mu$ F / 100V | 18 $\mu$ H  | MLCC 220pF / 3kV |

## Input Reflected Ripple Test Circuit

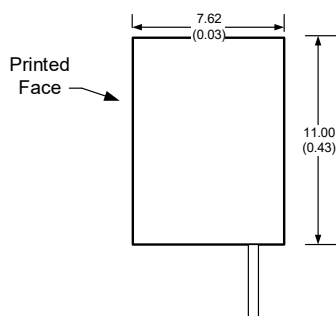
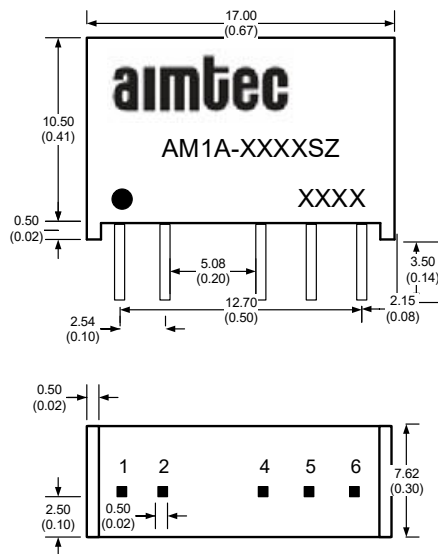


\* Tested at full load, and nominal input

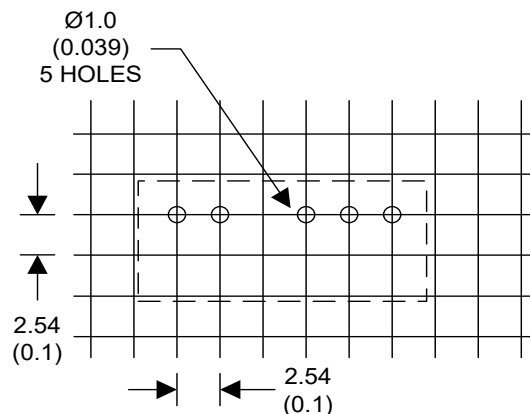
## Pin Out Specifications

| Pin | Single     | Dual       |
|-----|------------|------------|
| 1   | - V Input  | - V Input  |
| 2   | + V Input  | + V Input  |
| 4   | + V Output | + V Output |
| 5   | No pin     | Common     |
| 6   | - V Output | - V Output |

## Dimensions



NOTE: Unit mm [inch]  
Pin tolerances: 0.10mm [ 0.004inch]  
General tolerances: 0.25mm [ 0.010inch]



**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).