

## Series AM1/4S-Z

### 0.25 Watt | DC-DC Converter



#### FEATURES:

- RoHS compliant
- 4 Pin SIP Package
- Low ripple and noise
- High efficiency up to 72%
- Operating temperature -40°C to + 85°C
- Input / Output isolation 1000 and 3000VDC
- Pin compatible with multiple manufacturers



#### Models Single output

| Model            | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Input Current Full   NoLoad (mA) |    | Max Capacitive Load (uF) | Efficiency (%) |
|------------------|-------------------|--------------------|-------------------------|-----------------|----------------------------------|----|--------------------------|----------------|
| AM1/4S-0503SZ    | 4.5-5.5           | 3.3                | 75.7                    | 1000            | 78                               | 20 | 100                      | 64             |
| AM1/4S-0505SZ    | 4.5-5.5           | 5                  | 50                      | 1000            | 70                               | 17 | 100                      | 71             |
| AM1/4S-0507SZ    | 4.5-5.5           | 7.2                | 34.7                    | 1000            | 74                               | 18 | 100                      | 68             |
| AM1/4S-0509SZ    | 4.5-5.5           | 9                  | 27.77                   | 1000            | 68                               | 15 | 100                      | 73             |
| AM1/4S-0512SZ    | 4.5-5.5           | 12                 | 20.83                   | 1000            | 68                               | 14 | 100                      | 76             |
| AM1/4S-0515SZ    | 4.5-5.5           | 15                 | 16.67                   | 1000            | 70                               | 20 | 100                      | 71             |
| AM1/4S-0518SZ    | 4.5-5.5           | 18                 | 13.88                   | 1000            | 69                               | 17 | 100                      | 72             |
| AM1/4S-0524SZ    | 4.5-5.5           | 24                 | 10.41                   | 1000            | 65                               | 18 | 100                      | 77             |
| AM1/4S-1203SZ    | 10.8-13.2         | 3.3                | 75.7                    | 1000            | 32                               | 10 | 100                      | 65             |
| AM1/4S-1205SZ    | 10.8-13.2         | 5                  | 50                      | 1000            | 31                               | 12 | 100                      | 67             |
| AM1/4S-1207SZ    | 10.8-13.2         | 7.2                | 34.7                    | 1000            | 31                               | 10 | 100                      | 67             |
| AM1/4S-1209SZ    | 10.8-13.2         | 9                  | 27.7                    | 1000            | 33                               | 12 | 100                      | 64             |
| AM1/4S-1212SZ    | 10.8-13.2         | 12                 | 20.8                    | 1000            | 33                               | 15 | 100                      | 63             |
| AM1/4S-1215SZ    | 10.8-13.2         | 15                 | 16.6                    | 1000            | 31                               | 13 | 100                      | 67             |
| AM1/4S-1218SZ    | 10.8-13.2         | 18                 | 13.8                    | 1000            | 32                               | 13 | 100                      | 65             |
| AM1/4S-1224SZ    | 10.8-13.2         | 24                 | 10.4                    | 1000            | 38                               | 18 | 100                      | 55             |
| AM1/4S-1505SZ    | 13.5-16.5         | 5                  | 50                      | 1000            | 27                               | 8  | 100                      | 62             |
| AM1/4S-2403SZ    | 21.6-26.4         | 3.3                | 75.7                    | 1000            | 17                               | 8  | 100                      | 60             |
| AM1/4S-2405SZ    | 21.6-26.4         | 5                  | 50                      | 1000            | 17                               | 7  | 100                      | 58             |
| AM1/4S-2407SZ    | 21.6-26.4         | 7.2                | 34.7                    | 1000            | 18                               | 8  | 100                      | 57             |
| AM1/4S-2409SZ    | 21.6-26.4         | 9                  | 27.7                    | 1000            | 17                               | 8  | 100                      | 62             |
| AM1/4S-2412SZ    | 21.6-26.4         | 12                 | 20.8                    | 1000            | 19                               | 10 | 100                      | 56             |
| AM1/4S-2415SZ    | 21.6-26.4         | 15                 | 16.6                    | 1000            | 19                               | 7  | 100                      | 55             |
| AM1/4S-2418SZ    | 21.6-26.4         | 18                 | 13.8                    | 1000            | 18                               | 10 | 100                      | 57             |
| AM1/4S-2424SZ    | 21.6-26.4         | 24                 | 10.4                    | 1000            | 18                               | 10 | 100                      | 59             |
| AM1/4S-4803SZ    | 43.2-52.8         | 3.3                | 75.7                    | 1000            | 9                                | 8  | 100                      | 55             |
| AM1/4S-4805SZ    | 43.2-52.8         | 5                  | 50                      | 1000            | 10                               | 8  | 100                      | 53             |
| AM1/4S-4807SZ    | 43.2-52.8         | 7.2                | 34.7                    | 1000            | 10                               | 8  | 100                      | 54             |
| AM1/4S-4809SZ    | 43.2-52.8         | 9                  | 27.7                    | 1000            | 10                               | 8  | 100                      | 54             |
| AM1/4S-4812SZ    | 43.2-52.8         | 12                 | 20.8                    | 1000            | 9                                | 8  | 100                      | 55             |
| AM1/4S-4815SZ    | 43.2-52.8         | 15                 | 16.6                    | 1000            | 10                               | 8  | 100                      | 54             |
| AM1/4S-4818SZ    | 43.2-52.8         | 18                 | 13.88                   | 1000            | 11                               | 8  | 100                      | 49             |
| AM1/4S-4824SZ    | 43.2-52.8         | 24                 | 10.4                    | 1000            | 11                               | 10 | 100                      | 49             |
| AM1/4S-0503SH30Z | 4.5-5.5           | 3.3                | 75.7                    | 3000            | 78                               | 20 | 100                      | 64             |
| AM1/4S-0505SH30Z | 4.5-5.5           | 5                  | 50                      | 3000            | 70                               | 17 | 100                      | 71             |
| AM1/4S-0507SH30Z | 4.5-5.5           | 7.2                | 34.7                    | 3000            | 74                               | 18 | 100                      | 68             |
| AM1/4S-0509SH30Z | 4.5-5.5           | 9                  | 27.77                   | 3000            | 68                               | 15 | 100                      | 73             |
| AM1/4S-0512SH30Z | 4.5-5.5           | 12                 | 20.83                   | 3000            | 68                               | 14 | 100                      | 76             |
| AM1/4S-0515SH30Z | 4.5-5.5           | 15                 | 16.67                   | 3000            | 70                               | 20 | 100                      | 71             |
| AM1/4S-0518SH30Z | 4.5-5.5           | 18                 | 13.88                   | 3000            | 69                               | 17 | 100                      | 72             |
| AM1/4S-0524SH30Z | 4.5-5.5           | 24                 | 10.41                   | 3000            | 65                               | 18 | 100                      | 77             |
| AM1/4S-1203SH30Z | 10.8-13.2         | 3.3                | 75.7                    | 3000            | 32                               | 10 | 100                      | 65             |
| AM1/4S-1205SH30Z | 10.8-13.2         | 5                  | 50                      | 3000            | 31                               | 12 | 100                      | 67             |
| AM1/4S-1207SH30Z | 10.8-13.2         | 7.2                | 34.7                    | 3000            | 31                               | 10 | 100                      | 67             |
| AM1/4S-1209SH30Z | 10.8-13.2         | 9                  | 27.7                    | 3000            | 33                               | 12 | 100                      | 64             |
| AM1/4S-1212SH30Z | 10.8-13.2         | 12                 | 20.8                    | 3000            | 33                               | 15 | 100                      | 63             |
| AM1/4S-1215SH30Z | 10.8-13.2         | 15                 | 16.6                    | 3000            | 31                               | 13 | 100                      | 67             |
| AM1/4S-1218SH30Z | 10.8-13.2         | 18                 | 13.8                    | 3000            | 32                               | 13 | 100                      | 65             |

## Models

### Single output (continued)

| Model            | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Input Current Full   NoLoad (mA) |    | Max Capacitive Load (uF) | Efficiency (%) |
|------------------|-------------------|--------------------|-------------------------|-----------------|----------------------------------|----|--------------------------|----------------|
| AM1/4S-1224SH30Z | 10.8-13.2         | 24                 | 10.4                    | 3000            | 38                               | 18 | 100                      | 55             |
| AM1/4S-2403SH30Z | 21.6-26.4         | 3.3                | 75.7                    | 3000            | 17                               | 8  | 100                      | 60             |
| AM1/4S-2405SH30Z | 21.6-26.4         | 5                  | 50                      | 3000            | 17                               | 7  | 100                      | 58             |
| AM1/4S-2407SH30Z | 21.6-26.4         | 7.2                | 34.7                    | 3000            | 18                               | 8  | 100                      | 57             |
| AM1/4S-2409SH30Z | 21.6-26.4         | 9                  | 27.7                    | 3000            | 17                               | 8  | 100                      | 62             |
| AM1/4S-2412SH30Z | 21.6-26.4         | 12                 | 20.8                    | 3000            | 19                               | 10 | 100                      | 56             |
| AM1/4S-2415SH30Z | 21.6-26.4         | 15                 | 16.6                    | 3000            | 19                               | 7  | 100                      | 55             |
| AM1/4S-2418SH30Z | 21.6-26.4         | 18                 | 13.8                    | 3000            | 18                               | 10 | 100                      | 57             |
| AM1/4S-2424SH30Z | 21.6-26.4         | 24                 | 10.4                    | 3000            | 18                               | 10 | 100                      | 59             |
| AM1/4S-4803SH30Z | 43.2-52.8         | 3.3                | 75.7                    | 3000            | 9                                | 8  | 100                      | 55             |
| AM1/4S-4805SH30Z | 43.2-52.8         | 5                  | 50                      | 3000            | 10                               | 8  | 100                      | 53             |
| AM1/4S-4807SH30Z | 43.2-52.8         | 7.2                | 34.7                    | 3000            | 10                               | 8  | 100                      | 54             |
| AM1/4S-4809SH30Z | 43.2-52.8         | 9                  | 27.7                    | 3000            | 10                               | 8  | 100                      | 54             |
| AM1/4S-4812SH30Z | 43.2-52.8         | 12                 | 20.8                    | 3000            | 9                                | 8  | 100                      | 55             |
| AM1/4S-4815SH30Z | 43.2-52.8         | 15                 | 16.6                    | 3000            | 10                               | 8  | 100                      | 54             |
| AM1/4S-4818SH30Z | 43.2-52.8         | 18                 | 13.88                   | 3000            | 11                               | 8  | 100                      | 49             |
| AM1/4S-4824SH30Z | 43.2-52.8         | 24                 | 10.4                    | 3000            | 11                               | 10 | 100                      | 49             |

## Input Specifications

| Parameters                     | Nominal   | Typical     | Maximum | Units |
|--------------------------------|-----------|-------------|---------|-------|
| Voltage range                  | 5         | 4.5-5.5     |         | VDC   |
|                                | 12        | 10.8-13.2   |         |       |
|                                | 15        | 13.5 – 16.5 |         |       |
|                                | 24        | 21.6-26.4   |         |       |
|                                | 48        | 43.2-52.8   |         |       |
| Filter                         | Capacitor |             |         |       |
| Turn on transient process time |           |             | 25      | ms    |
| Start up time                  |           | 200         |         | ms    |
| Absolute maximum rating        | 5 Vin     | 7           |         | VDC   |
|                                | 12 Vin    | 15          |         |       |
|                                | 15 Vin    | 17          |         |       |
|                                | 24 Vin    | 28          |         |       |
|                                | 48 Vin    | 54          |         |       |
| Peak input voltage time        |           | 100         |         | ms    |

## Isolation Specifications

| Parameters         | Conditions | Typical | Rated         | Units |
|--------------------|------------|---------|---------------|-------|
| Tested I/O voltage | 60sec      |         | 1000 and 3000 | VDC   |
| Resistance         |            | > 1000  |               | MOhm  |
| Capacitance        |            | 60      |               | pF    |

## Output Specifications

| Parameters                                | Conditions           | Typical | Maximum | Units    |
|-------------------------------------------|----------------------|---------|---------|----------|
| Voltage accuracy                          |                      | ±3      |         | %        |
| Short circuit protection                  | Momentary (1sec)     |         |         |          |
| Line voltage regulation                   | For 1% change of Vin | ±1.2    |         | % of Vin |
| Load voltage regulation                   | Load 20 – 100%       | ±10     |         | %        |
| Load voltage regulation 3.3V output model | Load 20 – 100%       | ±20     |         | %        |
| Temperature coefficient                   |                      | ±0.02   |         | %/°C     |
| Ripple & noise                            | At 20MHz Bandwidth   | 100     |         | mV p-p   |
| Capacitive load                           |                      |         | 100     | μF       |
| Rising time                               |                      | 50      |         | ms       |

## General Specifications

| Parameters              | Conditions                   | Typical                                              | Maximum                 | Units |
|-------------------------|------------------------------|------------------------------------------------------|-------------------------|-------|
| Switching frequency     | 100% load                    | 80                                                   |                         | KHz   |
| Operating temperature   | Without derating             | -40to +85                                            |                         | °C    |
| Storage temperature     |                              | -40 to +125                                          |                         | °C    |
| Maximumcase temperature |                              |                                                      | 100                     | °C    |
| Cooling                 | Free air convection          |                                                      |                         |       |
| Humidity                |                              |                                                      | 95                      | %     |
| Case material           | Non-conductive black plastic |                                                      |                         |       |
| Weight                  |                              | 1.5                                                  |                         | g     |
| Dimensions (Lx W x H)   |                              | 0.46 x 0.24 x 0.40 inches                            | 11.68 x 6.00 x 10.16 mm |       |
| MTBF                    |                              | >1121000 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

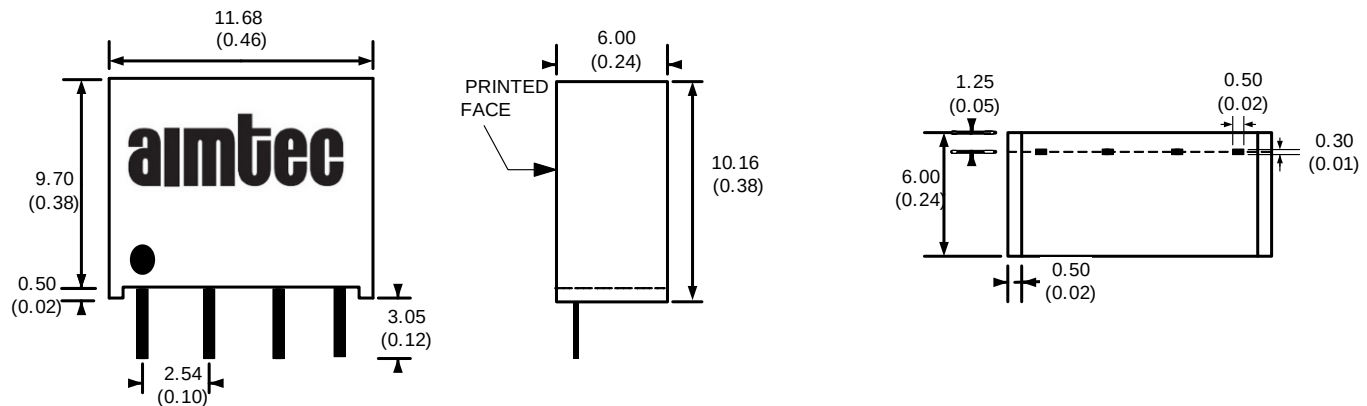
## Safety Specifications

| Parameters       |                                           |
|------------------|-------------------------------------------|
| Agency approvals | CE                                        |
| Standards        | EN55032 Class B (see recommended circuit) |

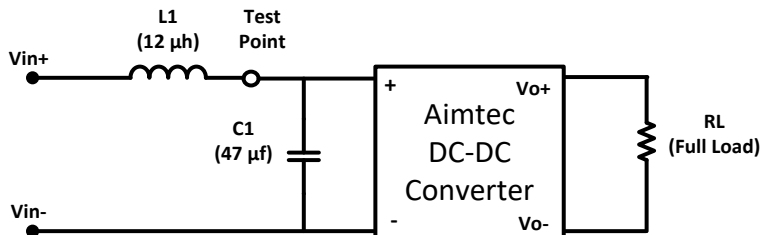
## Pin Out Specifications

| Pin | Single     |
|-----|------------|
| 1   | - V Input  |
| 2   | +V Input   |
| 3   | - V Output |
| 4   | +V Output  |

## Dimensions



## Input Reflected Ripple Current Measurement

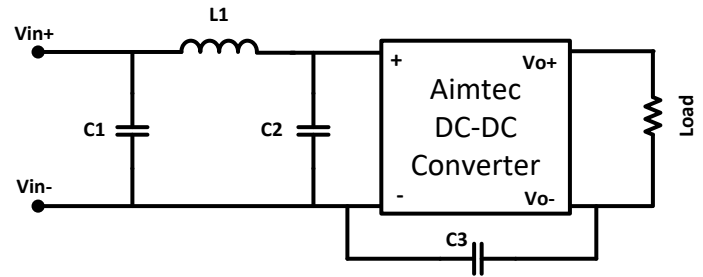


\* Tested at full load, and nominal input

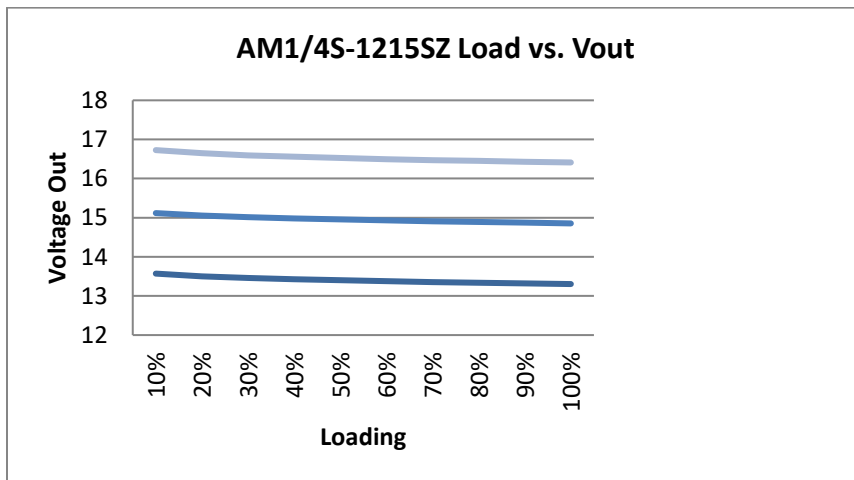
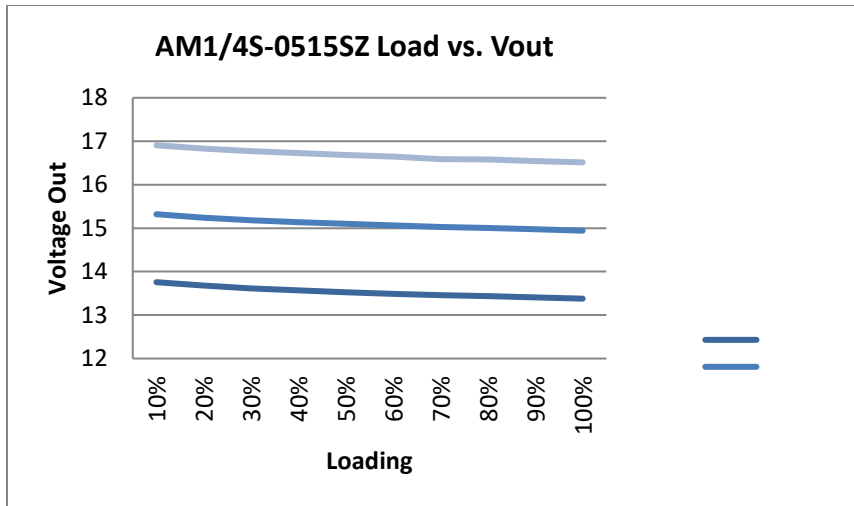
## EMI Filter Circuit Example

| Vin  | C1                  | L1         | C2                 | C3           |
|------|---------------------|------------|--------------------|--------------|
| 3.3V | 2.2 $\mu$ F / 100V  | 18 $\mu$ H |                    |              |
| 5 V  | 2.2 $\mu$ F / 100V  | 18 $\mu$ H |                    |              |
| 12 V | 2.2 $\mu$ F / 100V  | 18 $\mu$ H |                    |              |
| 15 V | 2.2 $\mu$ F / 100V  | 18 $\mu$ H |                    |              |
| 24 V | 2.2 $\mu$ F / 100V  | 18 $\mu$ H | 2.2 $\mu$ F / 100V | 470 pF / 2kV |
| 48 V | *2.2 $\mu$ F / 100V | 18 $\mu$ H | 2.2 $\mu$ F / 100V | 470 pF / 2kV |

\* Electrolytic type



## Typical Performance Examples



**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 than 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).