



### FEATURES:

- RoHS compliant SIP7 package
- High efficiency up to 81%
- I/O Isolation 6000 VDC
- Low coupling capacity
- Physical clearance of Isolation barrier 2.5mm
- Safety barrier 100% production tested
- Rated working voltage of 250 Vrms
- Continuous Short Circuit Protection



### Models Single output

| Model           | Input Voltage (V) | Output Voltage (V) | Output Current Max (mA) | Max Capacitive Load (uF) | Efficiency (%) |
|-----------------|-------------------|--------------------|-------------------------|--------------------------|----------------|
| AM1DC-0503SH60Z | 5                 | 3.3                | 303                     | 220                      | 75             |
| AM1DC-0505SH60Z | 5                 | 5                  | 200                     | 220                      | 77             |
| AM1DC-0509SH60Z | 5                 | 9                  | 111                     | 220                      | 77             |
| AM1DC-0512SH60Z | 5                 | 12                 | 83                      | 220                      | 76             |
| AM1DC-0515SH60Z | 5                 | 15                 | 67                      | 220                      | 77             |
| AM1DC-0903SH60Z | 9                 | 3.3                | 303                     | 220                      | 73             |
| AM1DC-0905SH60Z | 9                 | 5                  | 200                     | 220                      | 75             |
| AM1DC-0909SH60Z | 9                 | 9                  | 111                     | 220                      | 80             |
| AM1DC-0912SH60Z | 9                 | 12                 | 83                      | 220                      | 76             |
| AM1DC-0915SH60Z | 9                 | 15                 | 67                      | 220                      | 77             |
| AM1DC-1203SH60Z | 12                | 3.3                | 303                     | 220                      | 71             |
| AM1DC-1205SH60Z | 12                | 5                  | 200                     | 220                      | 74             |
| AM1DC-1209SH60Z | 12                | 9                  | 111                     | 220                      | 76             |
| AM1DC-1212SH60Z | 12                | 12                 | 83                      | 220                      | 80             |
| AM1DC-1215SH60Z | 12                | 15                 | 67                      | 220                      | 78             |
| AM1DC-1503SH60Z | 15                | 3.3                | 303                     | 220                      | 70             |
| AM1DC-1505SH60Z | 15                | 5                  | 200                     | 220                      | 72             |
| AM1DC-1509SH60Z | 15                | 9                  | 111                     | 220                      | 74             |
| AM1DC-1512SH60Z | 15                | 12                 | 83                      | 220                      | 76             |
| AM1DC-1515SH60Z | 15                | 15                 | 67                      | 220                      | 80             |
| AM1DC-2403SH60Z | 24                | 3.3                | 303                     | 220                      | 69             |
| AM1DC-2405SH60Z | 24                | 5                  | 200                     | 220                      | 71             |
| AM1DC-2409SH60Z | 24                | 9                  | 111                     | 220                      | 74             |
| AM1DC-2412SH60Z | 24                | 12                 | 83                      | 220                      | 76             |
| AM1DC-2415SH60Z | 24                | 15                 | 67                      | 220                      | 78             |

### Models Dual output

| Model             | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Max Capacitive Load (uF) | Efficiency (%) |
|-------------------|-------------------|--------------------|-------------------------|--------------------------|----------------|
| AM1DC-0503DH60Z   | 5                 | ±3.3               | ±152                    | ±100                     | 75             |
| AM1DC-0505DH60Z   | 5                 | ±5                 | ±100                    | ±100                     | 78             |
| AM1DC-0509DH60Z   | 5                 | ±9                 | ±56                     | ±100                     | 80             |
| AM1DC-0512DH60Z   | 5                 | ±12                | ±42                     | ±100                     | 77             |
| AM1DC-0515DH60Z   | 5                 | ±15                | ±33                     | ±100                     | 77             |
| AM1DC-051509DH60Z | 5                 | +15/-9             | +33/-55                 | ±100                     | 71             |
| AM1DC-0903DH60Z   | 9                 | ±3.3               | ±152                    | ±100                     | 72             |
| AM1DC-0905DH60Z   | 9                 | ±5                 | ±100                    | ±100                     | 77             |
| AM1DC-0909DH60Z   | 9                 | ±9                 | ±56                     | ±100                     | 81             |
| AM1DC-0912DH60Z   | 9                 | ±12                | ±42                     | ±100                     | 79             |
| AM1DC-0915DH60Z   | 9                 | ±15                | ±33                     | ±100                     | 73             |
| AM1DC-091509DH60Z | 9                 | +15/-9             | +33/-55                 | ±100                     | 77             |
| AM1DC-1203DH60Z   | 12                | ±3.3               | ±152                    | ±100                     | 70             |
| AM1DC-1205DH60Z   | 12                | ±5                 | ±100                    | ±100                     | 75             |
| AM1DC-1209DH60Z   | 12                | ±9                 | ±56                     | ±100                     | 78             |
| AM1DC-1212DH60Z   | 12                | ±12                | ±42                     | ±100                     | 81             |
| AM1DC-1215DH60Z   | 12                | ±15                | ±33                     | ±100                     | 76             |

## Models

### Dual output (continued)

| Model             | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Max Capacitive Load (uF) | Efficiency (%) |
|-------------------|-------------------|--------------------|-------------------------|--------------------------|----------------|
| AM1DC-121509DH60Z | 12                | +15/-9             | +33/-55                 | ±100                     | 76             |
| AM1DC-1503DH60Z   | 15                | ±3.3               | ±152                    | ±100                     | 70             |
| AM1DC-1505DH60Z   | 15                | ±5                 | ±100                    | ±100                     | 73             |
| AM1DC-1509DH60Z   | 15                | ±9                 | ±56                     | ±100                     | 77             |
| AM1DC-1512DH60Z   | 15                | ±12                | ±42                     | ±100                     | 80             |
| AM1DC-1515DH60Z   | 15                | ±15                | ±33                     | ±100                     | 81             |
| AM1DC-151509DH60Z | 15                | +15/-9             | +33/-55                 | ±100                     | 80             |
| AM1DC-2403DH60Z   | 24                | ±3.3               | ±152                    | ±100                     | 69             |
| AM1DC-2405DH60Z   | 24                | ±5                 | ±100                    | ±100                     | 70             |
| AM1DC-2409DH60Z   | 24                | ±9                 | ±56                     | ±100                     | 73             |
| AM1DC-2412DH60Z   | 24                | ±12                | ±42                     | ±100                     | 75             |
| AM1DC-2415DH60Z   | 24                | ±15                | ±33                     | ±100                     | 76             |
| AM1DC-241509DH60Z | 24                | +15/-9             | +33/-55                 | ±100                     | 75             |

\*Output ripple and noise are measured without external connection of filtering capacitors. For reducing these values please refer to the recommended circuit below.

## Input Specifications

| Parameters                     | Nominal                          | Typical   | Maximum | Units  |
|--------------------------------|----------------------------------|-----------|---------|--------|
| Voltage range                  | 5                                | 4.5-5.5   |         | VDC    |
|                                | 9                                | 8.1-9.9   |         |        |
|                                | 12                               | 10.8-13.2 |         |        |
|                                | 15                               | 13.5-16.5 |         |        |
|                                | 24                               | 21.6-26.4 |         |        |
| Filter                         | Capacitor                        |           |         |        |
| Turn on Transient process time | 5 Vin                            | 760       |         | µs     |
|                                | 9 Vin                            | 530       |         |        |
|                                | 12 Vin                           | 300       |         |        |
|                                | 15 Vin                           | 300       |         |        |
|                                | 24 Vin                           | 280       |         |        |
| Start up time                  | 5 Vin                            | 2.8       |         | ms     |
|                                | 9 Vin                            | 2.5       |         |        |
|                                | 12 Vin                           | 2.3       |         |        |
|                                | 15 Vin                           | 2.3       |         |        |
|                                | 24 Vin                           | 2.24      |         |        |
| Absolute Maximum Rating        | 5 Vin                            | 0-7       |         | VDC    |
|                                | 9 Vin                            | 0-12      |         |        |
|                                | 12 Vin                           | 0-15      |         |        |
|                                | 15 Vin                           | 0-18      |         |        |
|                                | 24 Vin                           | 0-28      |         |        |
| Peak Input Voltage time        |                                  |           | 100     | ms     |
| Quiescent Current              | 5 Vin                            | 40        |         | mA     |
|                                | 9 Vin                            | 30        |         |        |
|                                | 12 Vin                           | 20        |         |        |
|                                | 15 Vin                           | 15        |         |        |
|                                | 24 Vin                           | 10        |         |        |
| Rise time                      | 5 Vin                            | 180       |         | µs     |
|                                | 9 Vin                            | 190       |         |        |
|                                | 12 Vin                           | 200       |         |        |
|                                | 15 Vin                           | 190       |         |        |
|                                | 24 Vin                           | 180       |         |        |
| Input Reflected Ripple current | Thru 12µH inductor, 5Hz to 20MHz | 20        |         | mA rms |

### Isolation Specifications

| Parameters                           | Conditions             | Typical | Rated | Units |
|--------------------------------------|------------------------|---------|-------|-------|
| Tested I/O voltage (rated for 1 min) | Flash tested for 3sec. |         | 6000  | VDC   |
| Rated working voltage                |                        | 250     |       | V rms |
| Resistance                           |                        | >1000   |       | MOhm  |
| Capacitance                          |                        | 10      |       | pF    |

### Output Specifications

| Parameters                          | Conditions            | Typical       | Maximum | Units  |
|-------------------------------------|-----------------------|---------------|---------|--------|
| Voltage accuracy                    |                       | ±3            |         | %      |
| Voltage balance (Dual output model) | Balanced Load         | ±1            |         | %      |
| Short Circuit protection            |                       | Continuous    |         |        |
| Short circuit restart               |                       | Auto recovery |         |        |
| Line voltage regulation             | For 1% change of V in | ±1.2          |         | %      |
| Load voltage regulation             | From 10 to 100% load  | ±10           |         | %      |
| Temperature coefficient             |                       | ±0.03         |         | %/°C   |
| Ripple and Noise                    | 20MHz Bandwidth       |               | 220     | mV p-p |

### General Specifications

| Parameters               | Conditions   | Typical                                   | Maximum                 | Units |
|--------------------------|--|---|-------------------------|-------|
| Switching frequency      | 100% load, depending of the model                                | 20 - 50                                   |                         | KHz   |
| Clearance Distance       | Input to Output  | 2.5                                       |                         | mm    |
| Operating temperature    | Full Load without Derating                                       | -40 to +85                                |                         | °C    |
| Storage temperature      |  | -40 to +125                               |                         | °C    |
| Maximum case temperature |  |   | 100                     | °C    |
| Cooling                  |  | Free air convection                       |                         |       |
| Humidity                 |  |   | 95                      | % RH  |
| Case material            | Non-conductive black plastic, epoxy encapsulated (UL94V-0 rated) |   |                         |       |
| Soldering temperature    | 1.5mm from case for 10 sec.                                      |   | 260                     | °C    |
| Weight                   |  | 4.2                                       |                         | g     |
| Dimensions (L x W x H)   |  | 0.77 x 0.39 x 0.49 inches                 | 19.56 x 9.80 x 12.50 mm |       |
| MTBF                     |  | >2 390 000 hrs (MIL-HDBK-217 F at +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.

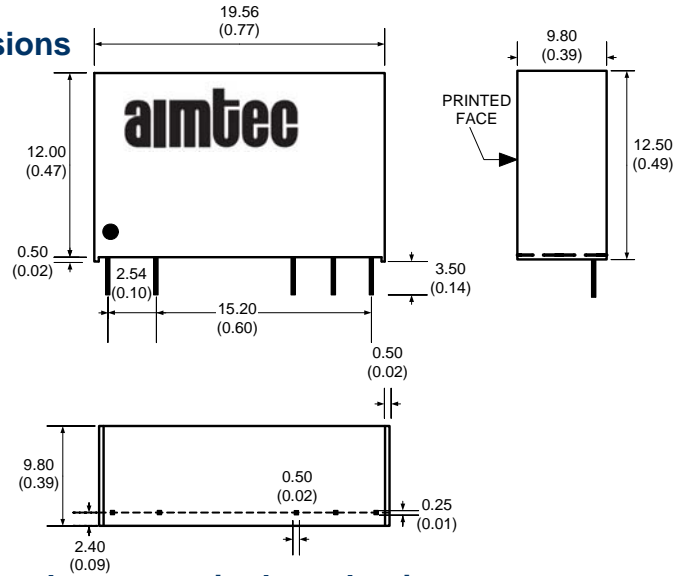
### Safety Specifications

| Parameters |  |
|------------|--|
| Standards  | EN 55022: 2010, Class B<br>EN 55024: 2010<br>IEC 61000-4-2: 2008, Criteria A<br>IEC 61000-4-3: 2010, Criteria A<br>IEC 61000-4-4: 2012, Criteria A<br>IEC 61000-4-6: 2008, Criteria A<br>IEC 61000-4-8: 2009, Criteria A<br>Designed to meet IEC 60950-1: 2001 |

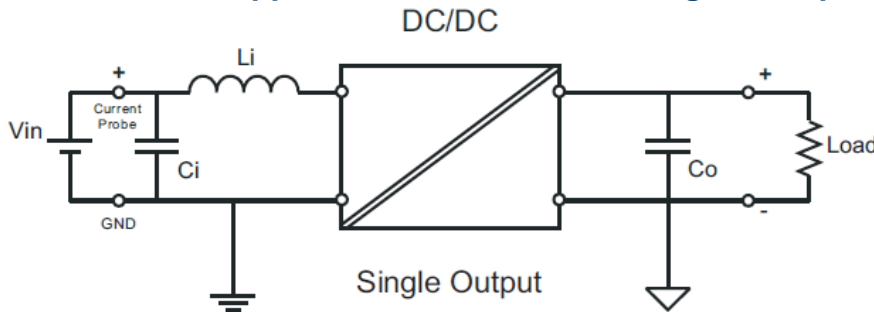
### Pin Out Specifications

| Pin | 6000 VDC   |            |
|-----|------------|------------|
|     | Single     | Dual       |
| 1   | + V Input  | + V Input  |
| 2   | - V Input  | - V Input  |
| 5   | - V Output | - V Output |
| 6   | No pin     | Common     |
| 7   | + V Output | + V Output |

### Dimensions

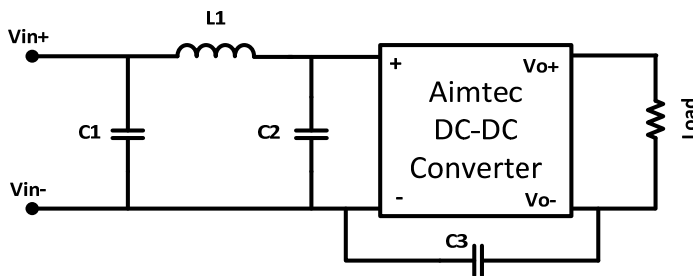


### Recommended Application circuit for reducing the output ripple and noises:



Recommended Output Capacitor to reduce the converter's ripple and noises for single output models is 4.7 $\mu$ F to 100 $\mu$ F and for dual output models is 4.7 $\mu$ F to 68 $\mu$ F connected to both outputs. Li with value of 12 $\mu$ H and Ci with value 10 $\mu$ F to 100 $\mu$ F are recommended to be connected to the input of the converter for EMI improvement.

### EMI Filter Circuit Example



| Vin            | C1                 | L1         | C2                 | C3           |
|----------------|--------------------|------------|--------------------|--------------|
| 5, 9, 12, 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 |

\* Electrolytic type

**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).