

## Series AM3N-D-RZ

### 3 Watt | DC-DC Converter



#### FEATURES:

- RoHS compliant
- 24 Pin DIP Package
- Low ripple and noise
- High efficiency up to 80%
- Low profile packaging
- Operating temperature -40°C to + 85°C
- Input / Output Isolation 1000, 3000 and 5200VDC
- Pin compatible with multiple manufacturers
- Continuous short circuit protection
- Dual regulated output



#### Models

#### Dual output

| Model            | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Capacitive Load (uF) | Efficiency (%) |
|------------------|-------------------|--------------------|-------------------------|-----------------|--------------------------|----------------|
| AM3N-0503D-RZ    | 4.5-5.5           | ±3.3               | ±400                    | 1000            | ±1000                    | 64             |
| AM3N-0505D-RZ    | 4.5-5.5           | ±5                 | ±300                    | 1000            | ±1000                    | 66             |
| AM3N-0507D-RZ    | 4.5-5.5           | ±7.2               | ±208                    | 1000            | ±470                     | 55             |
| AM3N-0509D-RZ    | 4.5-5.5           | ±9                 | ±167                    | 1000            | ±470                     | 68             |
| AM3N-0512D-RZ    | 4.5-5.5           | ±12                | ±125                    | 1000            | ±470                     | 70             |
| AM3N-0515D-RZ    | 4.5-5.5           | ±15                | ±100                    | 1000            | ±470                     | 70             |
| AM3N-0518D-RZ    | 4.5-5.5           | ±18                | ±84                     | 1000            | ±220                     | 57             |
| AM3N-0524D-RZ    | 4.5-5.5           | ±24                | ±63                     | 1000            | ±220                     | 69             |
| AM3N-1203D-RZ    | 10.8-13.2         | ±3.3               | ±400                    | 1000            | ±1000                    | 52             |
| AM3N-1205D-RZ    | 10.8-13.2         | ±5                 | ±300                    | 1000            | ±1000                    | 75             |
| AM3N-1207D-RZ    | 10.8-13.2         | ±7.2               | ±208                    | 1000            | ±470                     | 55             |
| AM3N-1209D-RZ    | 10.8-13.2         | ±9                 | ±167                    | 1000            | ±470                     | 78             |
| AM3N-1212D-RZ    | 10.8-13.2         | ±12                | ±125                    | 1000            | ±470                     | 80             |
| AM3N-1215D-RZ    | 10.8-13.2         | ±15                | ±100                    | 1000            | ±470                     | 78             |
| AM3N-1218D-RZ    | 10.8-13.2         | ±18                | ±84                     | 1000            | ±220                     | 62             |
| AM3N-1224D-RZ    | 10.8-13.2         | ±24                | ±63                     | 1000            | ±220                     | 76             |
| AM3N-2403D-RZ    | 21.6-26.4         | ±3.3               | ±400                    | 1000            | ±1000                    | 52             |
| AM3N-2405D-RZ    | 21.6-26.4         | ±5                 | ±300                    | 1000            | ±1000                    | 77             |
| AM3N-2407D-RZ    | 21.6-26.4         | ±7.2               | ±208                    | 1000            | ±470                     | 55             |
| AM3N-2409D-RZ    | 21.6-26.4         | ±9                 | ±167                    | 1000            | ±470                     | 78             |
| AM3N-2412D-RZ    | 21.6-26.4         | ±12                | ±125                    | 1000            | ±470                     | 80             |
| AM3N-2415D-RZ    | 21.6-26.4         | ±15                | ±100                    | 1000            | ±470                     | 78             |
| AM3N-2418D-RZ    | 21.6-26.4         | ±18                | ±84                     | 1000            | ±220                     | 65             |
| AM3N-2424D-RZ    | 21.6-26.4         | ±24                | ±63                     | 1000            | ±220                     | 76             |
| AM3N-0503DH30-RZ | 4.5-5.5           | ±3.3               | ±400                    | 3000            | ±1000                    | 64             |
| AM3N-0505DH30-RZ | 4.5-5.5           | ±5                 | ±300                    | 3000            | ±1000                    | 66             |
| AM3N-0507DH30-RZ | 4.5-5.5           | ±7.2               | ±208                    | 3000            | ±470                     | 55             |
| AM3N-0509DH30-RZ | 4.5-5.5           | ±9                 | ±167                    | 3000            | ±470                     | 68             |
| AM3N-0512DH30-RZ | 4.5-5.5           | ±12                | ±125                    | 3000            | ±470                     | 70             |
| AM3N-0515DH30-RZ | 4.5-5.5           | ±15                | ±100                    | 3000            | ±470                     | 70             |
| AM3N-0518DH30-RZ | 4.5-5.5           | ±18                | ±84                     | 3000            | ±220                     | 57             |
| AM3N-0524DH30-RZ | 4.5-5.5           | ±24                | ±63                     | 3000            | ±220                     | 69             |
| AM3N-1203DH30-RZ | 10.8-13.2         | ±3.3               | ±400                    | 3000            | ±1000                    | 64             |
| AM3N-1205DH30-RZ | 10.8-13.2         | ±5                 | ±300                    | 3000            | ±1000                    | 75             |
| AM3N-1207DH30-RZ | 10.8-13.2         | ±7.2               | ±208                    | 3000            | ±470                     | 55             |
| AM3N-1209DH30-RZ | 10.8-13.2         | ±9                 | ±167                    | 3000            | ±470                     | 78             |
| AM3N-1212DH30-RZ | 10.8-13.2         | ±12                | ±125                    | 3000            | ±470                     | 80             |
| AM3N-1215DH30-RZ | 10.8-13.2         | ±15                | ±100                    | 3000            | ±470                     | 78             |
| AM3N-1218DH30-RZ | 10.8-13.2         | ±18                | ±84                     | 3000            | ±220                     | 62             |
| AM3N-1224DH30-RZ | 10.8-13.2         | ±24                | ±63                     | 3000            | ±220                     | 76             |
| AM3N-2403DH30-RZ | 21.6-26.4         | ±3.3               | ±400                    | 3000            | ±1000                    | 64             |
| AM3N-2405DH30-RZ | 21.6-26.4         | ±5                 | ±300                    | 3000            | ±1000                    | 77             |
| AM3N-2407DH30-RZ | 21.6-26.4         | ±7.2               | ±208                    | 3000            | ±470                     | 55             |
| AM3N-2409DH30-RZ | 21.6-26.4         | ±9                 | ±167                    | 3000            | ±470                     | 78             |
| AM3N-2412DH30-RZ | 21.6-26.4         | ±12                | ±125                    | 3000            | ±470                     | 80             |

|                  |           |     |      |      |      |    |
|------------------|-----------|-----|------|------|------|----|
| AM3N-2415DH30-RZ | 21.6-26.4 | ±15 | ±100 | 3000 | ±470 | 78 |
|------------------|-----------|-----|------|------|------|----|

### Models

#### Dual output (Continue)

| Model            | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Capacitive Load (uF) | Efficiency (%) |
|------------------|-------------------|--------------------|-------------------------|-----------------|--------------------------|----------------|
| AM3N-2418DH30-RZ | 21.6-26.4         | ±18                | ±84                     | 3000            | ±220                     | 65             |
| AM3N-2424DH30-RZ | 21.6-26.4         | ±24                | ±63                     | 3000            | ±220                     | 76             |
| AM3N-0503DH52-RZ | 4.5-5.5           | ±3.3               | ±400                    | 5200            | ±1000                    | 64             |
| AM3N-0505DH52-RZ | 4.5-5.5           | ±5                 | ±300                    | 5200            | ±1000                    | 66             |
| AM3N-0507DH52-RZ | 4.5-5.5           | ±7.2               | ±208                    | 5200            | ±470                     | 53             |
| AM3N-0509DH52-RZ | 4.5-5.5           | ±9                 | ±167                    | 5200            | ±470                     | 68             |
| AM3N-0512DH52-RZ | 4.5-5.5           | ±12                | ±125                    | 5200            | ±470                     | 70             |
| AM3N-0515DH52-RZ | 4.5-5.5           | ±15                | ±100                    | 5200            | ±470                     | 70             |
| AM3N-0518DH52-RZ | 4.5-5.5           | ±18                | ±84                     | 5200            | ±220                     | 57             |
| AM3N-0524DH52-RZ | 4.5-5.5           | ±24                | ±63                     | 5200            | ±220                     | 69             |
| AM3N-1203DH52-RZ | 10.8-13.2         | ±3.3               | ±400                    | 5200            | ±1000                    | 64             |
| AM3N-1205DH52-RZ | 10.8-13.2         | ±5                 | ±300                    | 5200            | ±1000                    | 75             |
| AM3N-1207DH52-RZ | 10.8-13.2         | ±7.2               | ±208                    | 5200            | ±470                     | 55             |
| AM3N-1209DH52-RZ | 10.8-13.2         | ±9                 | ±167                    | 5200            | ±470                     | 78             |
| AM3N-1212DH52-RZ | 10.8-13.2         | ±12                | ±125                    | 5200            | ±470                     | 80             |
| AM3N-1215DH52-RZ | 10.8-13.2         | ±15                | ±100                    | 5200            | ±470                     | 78             |
| AM3N-1218DH52-RZ | 10.8-13.2         | ±18                | ±84                     | 5200            | ±220                     | 62             |
| AM3N-1224DH52-RZ | 10.8-13.2         | ±24                | ±63                     | 5200            | ±220                     | 76             |
| AM3N-2403DH52-RZ | 21.6-26.4         | ±3.3               | ±400                    | 5200            | ±1000                    | 64             |
| AM3N-2405DH52-RZ | 21.6-26.4         | ±5                 | ±300                    | 5200            | ±1000                    | 77             |
| AM3N-2407DH52-RZ | 21.6-26.4         | ±7.2               | ±208                    | 5200            | ±470                     | 53             |
| AM3N-2409DH52-RZ | 21.6-26.4         | ±9                 | ±167                    | 5200            | ±470                     | 78             |
| AM3N-2412DH52-RZ | 21.6-26.4         | ±12                | ±125                    | 5200            | ±470                     | 80             |
| AM3N-2415DH52-RZ | 21.6-26.4         | ±15                | ±100                    | 5200            | ±470                     | 78             |
| AM3N-2418DH52-RZ | 21.6-26.4         | ±18                | ±84                     | 5200            | ±220                     | 65             |
| AM3N-2424DH52-RZ | 21.6-26.4         | ±24                | ±63                     | 5200            | ±220                     | 76             |

### Input Specifications

| Parameters                     | Nominal                   | Typical                           | Maximum | Units |
|--------------------------------|---------------------------|-----------------------------------|---------|-------|
| Voltage range                  | 5<br>12<br>24             | 4.5-5.5<br>10.8-13.2<br>21.6-26.4 |         | VDC   |
| Filter                         | $\pi$ (Pi) Network        |                                   |         |       |
| Turn on Transient process time |                           |                                   | 100     | ms    |
| Start up time                  |                           | 300                               |         | ms    |
| Absolute Maximum Rating        | 5 Vin<br>12 Vin<br>24 Vin | 0-7<br>0-15<br>0-28               |         | VDC   |
| Peak Input Voltage time        |                           | 100                               |         | ms    |

### Isolation Specifications

| Parameters         | Conditions | Typical | Rated               | Units |
|--------------------|------------|---------|---------------------|-------|
| Tested I/O voltage | 3 sec      |         | 1000, 3000 and 5200 | VDC   |
| Resistance         |            | > 1000  |                     | MOhm  |
| Capacitance        |            | 60      |                     | pF    |

### Output Specifications

| Parameters               | Conditions    | Typical | Maximum | Units |
|--------------------------|---------------|---------|---------|-------|
| Voltage accuracy         |               | ±2      |         | %     |
| Voltage balance          |               | ±1      |         | %     |
| Short Circuit protection | Continuous    |         |         |       |
| Short circuit restart    | Auto-recovery |         |         |       |

## Output Specifications (continued)

| Parameters                                       | Conditions         | Typical | Maximum | Units  |
|--------------------------------------------------|--------------------|---------|---------|--------|
| Line voltage regulation (Dual)                   |                    | ±0.5    |         | %      |
| Load voltage regulation (Dual)                   | 0 to 100% load     | ±0.5    |         | %      |
| Load voltage regulation (Dual) 3.3V output model | 0 to 100% load     | ±1.5    |         | %      |
| Temperature coefficient                          |                    | ±0.02   |         | %/°C   |
| Ripple & Noise                                   | At 20MHz Bandwidth | 75      |         | mV p-p |
| Rising time                                      |                    | 150     |         | ms     |

## General Specifications

| Parameters             | Conditions                                              | Typical                   | Maximum                  | Units |
|------------------------|---------------------------------------------------------|---------------------------|--------------------------|-------|
| Switching frequency    | 100% load                                               | 250                       |                          | KHz   |
| Operating temperature  | Full Load without Derating                              | -40 to +85                |                          | °C    |
| Storage temperature    |                                                         | -40 to +125               |                          | °C    |
| Max Case temperature   |                                                         |                           | 95                       | °C    |
| Cooling                | Free air convection                                     |                           |                          |       |
| Humidity               |                                                         |                           | 90                       | %     |
| Case material          | Nickel coated copper, at 5200VDC plastic                |                           |                          |       |
| Weight                 |                                                         | 14.5                      |                          | g     |
| Dimensions (L x W x H) | Tolerance ±0.5 mm or ±0.02 inches                       | 1.25 x 0.80 x 0.40 inches | 31.75 x 20.32 x 10.16 mm |       |
| MTBF                   | >3 000 000 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

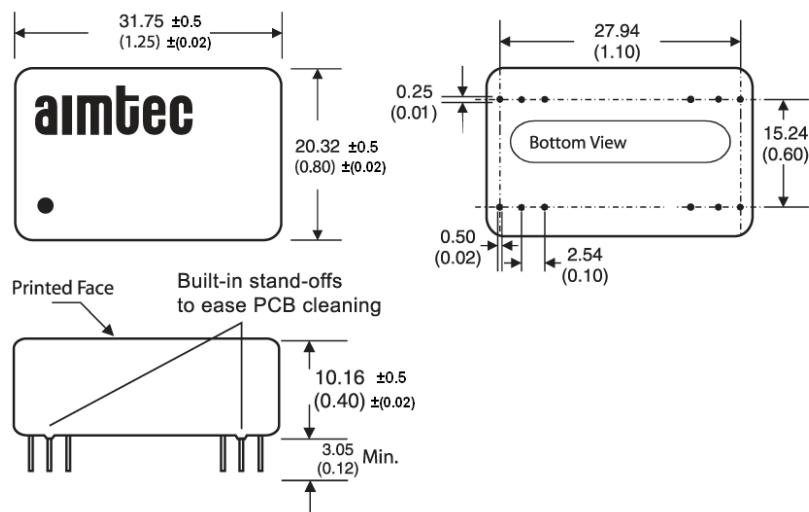
## Safety Specifications

| Parameters       |                                                                   |
|------------------|-------------------------------------------------------------------|
| Agency Approvals | CE                                                                |
| Standards        | EN55022 Class A,                                                  |
|                  | 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                                    |

## Pin Out Specifications

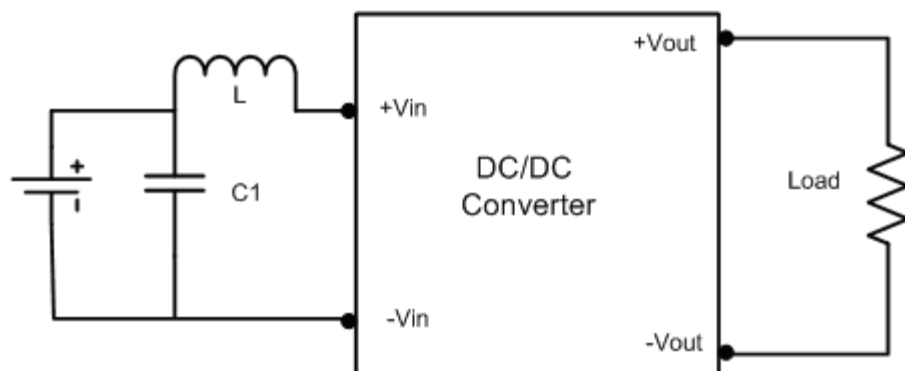
| Pin | 1000VDC   | 3000 and 5200VDC |
|-----|-----------|------------------|
|     | Dual      | Dual             |
| 1   | +V Input  | +V Input         |
| 2   | -V Output | +V Input         |
| 3   | Common    | No pin           |
| 10  | Common    | Common           |
| 11  | +V Output | Common           |
| 12  | -V Input  | No pin           |
| 13  | -V Input  | -V Output        |
| 14  | +V Output | No pin           |
| 15  | Common    | +V Output        |
| 22  | Common    | No pin           |
| 23  | -V Output | -V Input         |
| 24  | +V Input  | -V Input         |

## Dimensions



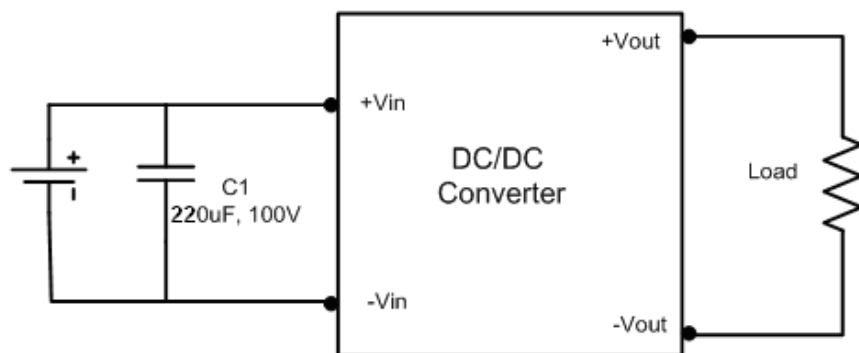
## Test Circuits

### Conducted Emissions:



| C1               | L1         |
|------------------|------------|
| 220 $\mu$ F/100V | 22 $\mu$ H |

### Surge:



**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).