

**FEATURES:**

- Unregulated
- High efficiency up to 86%
- 7 pin SIP package
- Operating temperature -40°C to + 105°C
- 1500 & 3000VDC Isolation
- Continuous short circuit protection except with models marked with ‡

### Models

#### Single output



| Model               | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Cap Load (μF) | Efficiency (%) |
|---------------------|-------------------|--------------------|-------------------------|-----------------|-------------------|----------------|
| AM2DS-0503S-NZ      | 4.5-5.5           | 3.3                | 400                     | 1500            | 220               | 79             |
| AM2DS-0505S-NZ      | 4.5-5.5           | 5                  | 400                     | 1500            | 220               | 84             |
| AM2DS-0509S-NZ      | 4.5-5.5           | 9                  | 222                     | 1500            | 220               | 79             |
| AM2DS-0512S-NZ      | 4.5-5.5           | 12                 | 167                     | 1500            | 220               | 84             |
| AM2DS-0515S-NZ      | 4.5-5.5           | 15                 | 133                     | 1500            | 220               | 84             |
| AM2DS-0524S-NZ ‡    | 4.5-5.5           | 24                 | 83                      | 1500            | 220               | 84             |
| AM2DS-1203S-NZ ‡    | 10.8-13.2         | 3.3                | 400                     | 1500            | 220               | 79             |
| AM2DS-1205S-NZ ‡    | 10.8-13.2         | 5                  | 400                     | 1500            | 220               | 82             |
| AM2DS-1209S-NZ ‡    | 10.8-13.2         | 9                  | 222                     | 1500            | 220               | 81             |
| AM2DS-1212S-NZ ‡    | 10.8-13.2         | 12                 | 167                     | 1500            | 220               | 84             |
| AM2DS-1215S-NZ ‡    | 10.8-13.2         | 15                 | 133                     | 1500            | 220               | 85             |
| AM2DS-1224S-NZ ‡    | 10.8-13.2         | 24                 | 83                      | 1500            | 220               | 86             |
| AM2DS-2403S-NZ ‡    | 21.6-26.4         | 3.3                | 400                     | 1500            | 220               | 79             |
| AM2DS-2405S-NZ ‡    | 21.6-26.4         | 5                  | 400                     | 1500            | 220               | 80             |
| AM2DS-2412S-NZ ‡    | 21.6-26.4         | 12                 | 167                     | 1500            | 220               | 84             |
| AM2DS-2415S-NZ ‡    | 21.6-26.4         | 15                 | 133                     | 1500            | 220               | 86             |
| AM2DS-2424S-NZ ‡    | 21.6-26.4         | 24                 | 83                      | 1500            | 220               | 86             |
| AM2DS-0505SH30-NZ   | 4.5-5.5           | 5                  | 400                     | 3000            | 220               | 82             |
| AM2DS-0512SH30-NZ   | 4.5-5.5           | 12                 | 167                     | 3000            | 220               | 82             |
| AM2DS-0515SH30-NZ   | 4.5-5.5           | 15                 | 133                     | 3000            | 220               | 83             |
| AM2DS-0524SH30-NZ ‡ | 4.5-5.5           | 24                 | 83                      | 3000            | 220               | 84             |
| AM2DS-1205SH30-NZ ‡ | 10.8-13.2         | 5                  | 400                     | 3000            | 220               | 82             |
| AM2DS-1212SH30-NZ ‡ | 10.8-13.2         | 12                 | 167                     | 3000            | 220               | 84             |
| AM2DS-1215SH30-NZ ‡ | 10.8-13.2         | 15                 | 133                     | 3000            | 220               | 85             |
| AM2DS-2405SH30-NZ ‡ | 21.6-26.4         | 5                  | 400                     | 3000            | 220               | 80             |
| AM2DS-2409SH30-NZ ‡ | 21.6-26.4         | 9                  | 222                     | 3000            | 220               | 86             |
| AM2DS-2412SH30-NZ ‡ | 21.6-26.4         | 12                 | 167                     | 3000            | 220               | 84             |
| AM2DS-2415SH30-NZ ‡ | 21.6-26.4         | 15                 | 133                     | 3000            | 220               | 86             |
| AM2DS-2424SH30-NZ ‡ | 21.6-26.4         | 24                 | 83                      | 3000            | 220               | 86             |

### Models

#### Dual output

| Model            | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Cap Load (μF) | Efficiency (%) |
|------------------|-------------------|--------------------|-------------------------|-----------------|-------------------|----------------|
| AM2DS-0505D-NZ   | 4.5-5.5           | ±5                 | ±200                    | 1500            | 100               | 80             |
| AM2DS-0509D-NZ   | 4.5-5.5           | ±9                 | ±111                    | 1500            | 100               | 84             |
| AM2DS-0512D-NZ   | 4.5-5.5           | ±12                | ±83                     | 1500            | 100               | 84             |
| AM2DS-0515D-NZ   | 4.5-5.5           | ±15                | ±67                     | 1500            | 100               | 82             |
| AM2DS-0524D-NZ ‡ | 4.5-5.5           | ±24                | ±42                     | 1500            | 100               | 84             |
| AM2DS-1205D-NZ ‡ | 10.8-13.2         | ±5                 | ±200                    | 1500            | 100               | 80             |
| AM2DS-1209D-NZ ‡ | 10.8-13.2         | ±9                 | ±111                    | 1500            | 100               | 82             |
| AM2DS-1212D-NZ ‡ | 10.8-13.2         | ±12                | ±83                     | 1500            | 100               | 84             |
| AM2DS-1215D-NZ ‡ | 10.8-13.2         | ±15                | ±67                     | 1500            | 100               | 84             |
| AM2DS-1515D-NZ ‡ | 13.5-16.5         | ±15                | ±67                     | 1500            | 100               | 81             |

|                     |           |     |      |      |     |    |
|---------------------|-----------|-----|------|------|-----|----|
| AM2DS-2405D-NZ ‡    | 21.6-26.4 | ±5  | ±200 | 1500 | 100 | 80 |
| AM2DS-2409D-NZ ‡    | 21.6-26.4 | ±9  | ±111 | 1500 | 100 | 86 |
| AM2DS-2412D-NZ ‡    | 21.6-26.4 | ±12 | ±83  | 1500 | 100 | 84 |
| AM2DS-2415D-NZ ‡    | 21.6-26.4 | ±15 | ±67  | 1500 | 100 | 84 |
| AM2DS-0505DH30-NZ   | 4.5-5.5   | ±5  | ±200 | 3000 | 100 | 80 |
| AM2DS-0509DH30-NZ   | 4.5-5.5   | ±9  | ±111 | 3000 | 100 | 84 |
| AM2DS-0512DH30-NZ   | 4.5-5.5   | ±12 | ±83  | 3000 | 100 | 83 |
| AM2DS-0515DH30-NZ   | 4.5-5.5   | ±15 | ±67  | 3000 | 100 | 82 |
| AM2DS-0524DH30-NZ ‡ | 4.5-5.5   | ±24 | ±42  | 3000 | 100 | 84 |
| AM2DS-1205DH30-NZ ‡ | 10.8-13.2 | ±5  | ±200 | 3000 | 100 | 80 |
| AM2DS-1209DH30-NZ ‡ | 10.8-13.2 | ±9  | ±111 | 3000 | 100 | 82 |
| AM2DS-1212DH30-NZ ‡ | 10.8-13.2 | ±12 | ±83  | 3000 | 100 | 84 |
| AM2DS-1215DH30-NZ ‡ | 10.8-13.2 | ±15 | ±67  | 3000 | 100 | 84 |
| AM2DS-2405DH30-NZ ‡ | 21.6-26.4 | ±5  | ±200 | 3000 | 100 | 80 |
| AM2DS-2409DH30-NZ ‡ | 21.6-26.4 | ±9  | ±111 | 3000 | 100 | 84 |
| AM2DS-2412DH30-NZ ‡ | 21.6-26.4 | ±12 | ±83  | 3000 | 100 | 84 |
| AM2DS-2415DH30-NZ ‡ | 21.6-26.4 | ±15 | ±67  | 3000 | 100 | 84 |

‡ With Momentary short circuit protection of 1 second

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.

## Input Specifications

| Parameters                               | Nominal   | Typical   | Maximum | Units |
|------------------------------------------|-----------|-----------|---------|-------|
| Voltage range                            | 5         | 4.5-5.5   |         | VDC   |
|                                          | 12        | 10.8-13.2 |         | VDC   |
|                                          | 15        | 13.5-16.5 |         | VDC   |
|                                          | 24        | 21.6-26.4 |         | VDC   |
| Filter                                   | Capacitor |           |         |       |
| Absolute Maximum Rating<br>(1 sec. max.) | 5         |           | 9       | VDC   |
|                                          | 12        |           | 18      | VDC   |
|                                          | 15        |           | 21      | VDC   |
|                                          | 24        |           | 30      | VDC   |
| Reflected Ripple Input Current           |           |           | 15      | mA    |

## Isolation Specifications

| Parameters         | Conditions    | Typical | Rated      | Units |
|--------------------|---------------|---------|------------|-------|
| Tested I/O voltage | 60 sec        |         | 1500, 3000 | VDC   |
| Resistance         | 500VDC        | > 1000  |            | MOhm  |
| Capacitance        | (100Khz/0.1V) | 20      |            | pF    |

## Output Specifications

| Parameters               | Conditions                              | Typical | Maximum | Units    |
|--------------------------|-----------------------------------------|---------|---------|----------|
| Voltage accuracy         | (see tolerance chart)                   | ±5      |         | %        |
| Short Circuit protection | Continuous, unless marked with ‡        |         |         |          |
| Short circuit restart    | Auto recovery                           |         |         |          |
| Line voltage regulation  | For ±1.0% change of Vin, 3.3Vout models |         | ±1.5    | % of Vin |
|                          | For ±1.0% change of Vin, Others         |         | ±1.2    | % of Vin |
| Load voltage regulation  | 10~100% load, 3.3V output models        | 18      |         | %        |
|                          | 10~100% load, 5V output models          | 12      |         | %        |
|                          | 10~100% load, 9V output models          | 9       |         | %        |
|                          | 10~100% load, 12V output models         | 8       |         | %        |
|                          | 10~100% load, 15V output models         | 7       |         | %        |
|                          | 10~100% load, 24V output models         | 6       |         | %        |
| Temperature coefficient  |                                         |         | ±0.03   | %/°C     |
| Ripple & Noise           | 20MHz Bandwidth                         | 75      | 200     | mV p-p   |

## General Specifications

| Parameters                    | Conditions                                              | Typical                | Maximum | Units |
|-------------------------------|---------------------------------------------------------|------------------------|---------|-------|
| Switching frequency           | 100% load                                               | 100                    |         | KHz   |
| Operating temperature         | Derating Above 85°C                                     | -40 to +105            |         | °C    |
| Storage temperature           |                                                         | -55 to +125            |         | °C    |
| Humidity                      |                                                         |                        | 95      | % RH  |
| Case material                 | Non-conductive black plastic (UL94V-0 rated)            |                        |         |       |
| Weight                        |                                                         | 2.4                    |         | g     |
| Dimensions (L x W x H)        | 0.77 x 0.28 x 0.40inches                                | 19.65 x 7.05 x 10.16mm |         |       |
| MTBF                          | >3,500,000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C) |                        |         |       |
| Maximum soldering temperature | 1.5 mm from case for 10sec                              |                        | 300     | °C    |
| Maximum case temperature      |                                                         |                        | 130     | °C    |
| Cooling                       | Free air convection                                     |                        |         |       |

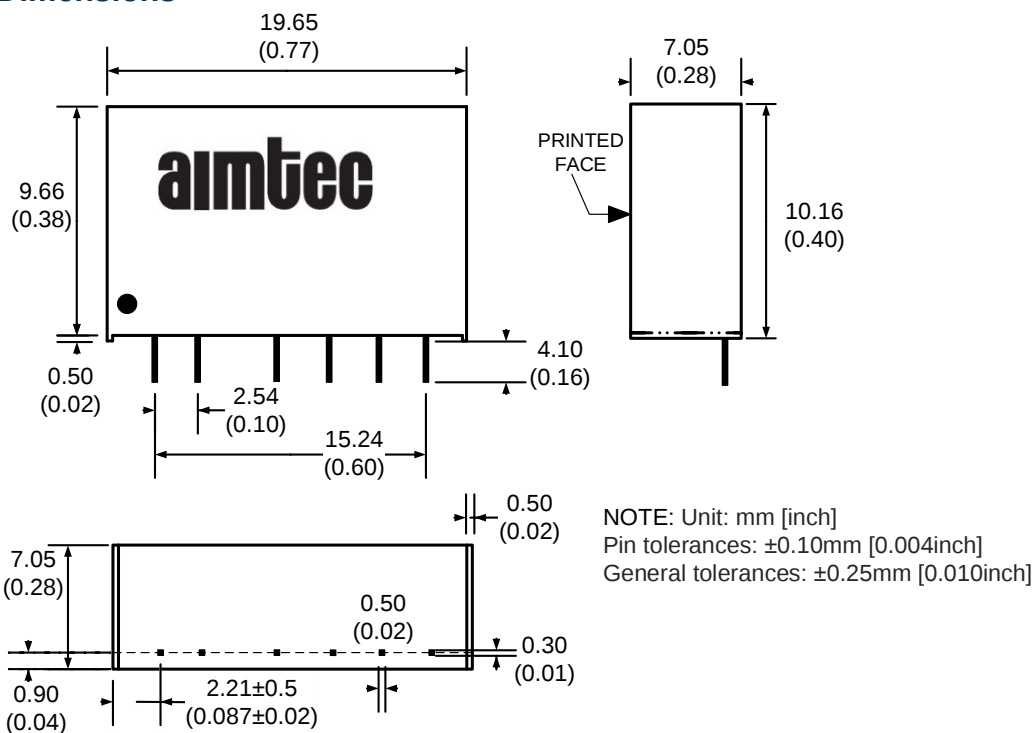
## Safety Specifications

| Parameters       |                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Agency approvals | cULus (without 15V input and without 3.3V output models)                                                                                                            |
| Standards        | UL 60950-1                                                                                                                                                          |
|                  | EMI - Conducted and radiated emission CISPR32 / EN55032, class B (with the recommended EMC circuit)                                                                 |
|                  | Electrostatic Discharge Immunity IEC 61000-4-2, Contact ±6KV for dual output models, Criteria B<br>IEC 61000-4-2, Contact ±8KV for single output models, Criteria B |

## Pin Out Specifications

| Pin | 1500 VDC   |            | 3000VDC    |            |
|-----|------------|------------|------------|------------|
|     | Single     | Dual       | Single     | Dual       |
| 1   | + V Input  | + V Input  | + V Input  | + V Input  |
| 2   | - V Input  | - V Input  | - V Input  | - V Input  |
| 4   | - V Output | - V Output | No pin     | No pin     |
| 5   | No pin     | Common     | - V Output | - V Output |
| 6   | + V Output | + V Output | No pin     | Common     |
| 7   | No pin     | No pin     | + V Output | + V Output |

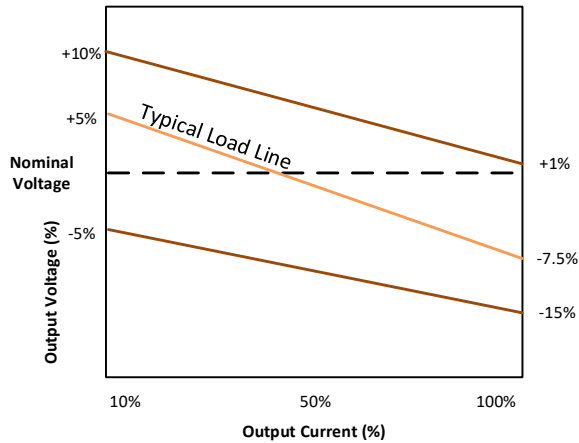
## Dimensions



## Typical characteristics

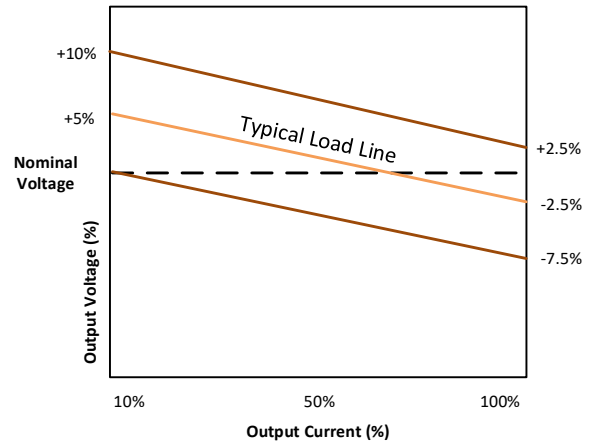
3.3VDC output models

Tolerance Envelope Graph

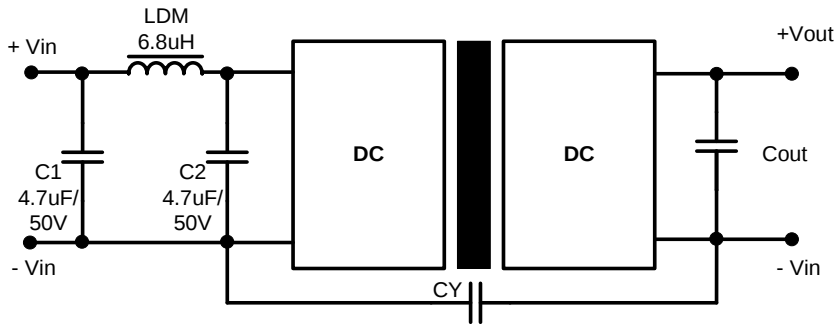


Other models

Tolerance Envelope Graph



## Recommended Circuit for EMI Class B



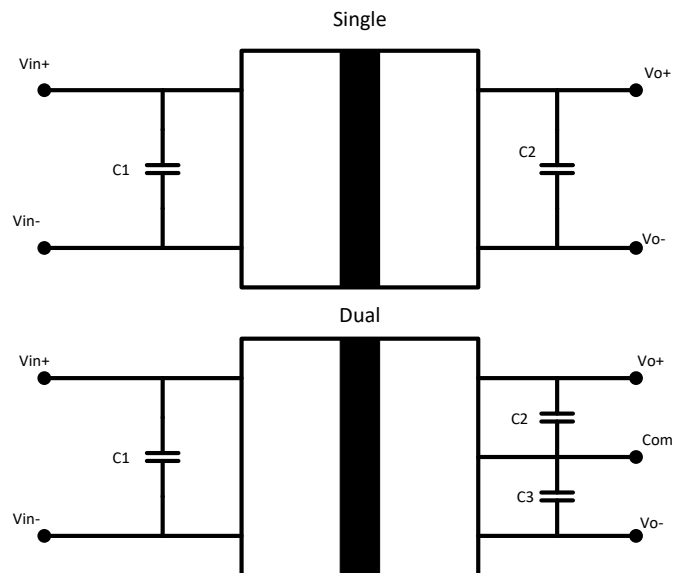
| Vin | CY For 1.5KVDC isolation | CY For 3KVDC isolation | Cout                                          |
|-----|--------------------------|------------------------|-----------------------------------------------|
| 5   | -                        | -                      | Refer to C2/C3 in Typical Application Circuit |
| 9   | -                        | -                      |                                               |
| 12  | -                        | -                      |                                               |
| 15  | -                        | -                      |                                               |
| 24  | 1nF/2KV                  | 1nF/3KV                |                                               |

## Typical Application Circuit

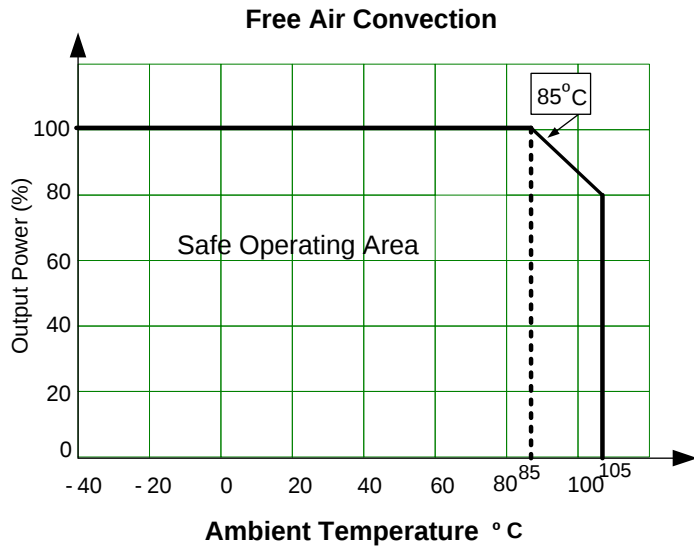
### Capacitor selection Table

| Vin | C1    | Single VDC | C2    | Dual VDC   | C2/C3   |
|-----|-------|------------|-------|------------|---------|
| 5   | 4.7μF | 3.3 / 5V   | 10μF  | ±3.3 / ±5V | 4.7 μF  |
| 12  | 2.2μF | 9 / 12V    | 2.2μF | ±9 / ±12V  | 1 μF    |
| 15  | 2.2μF | 15V        | 1μF   | ±15V       | 0.47 μF |
| 24  | 1μF   | 24V        | 1μF   | ±24V       | 0.47 μF |

- 1) Ensure output load of Min 10%, or specifications may not be met
- 2) Under normal operation, there is no protection for overload condition
- 3) Converter may exhibit start up delay if capacitive load exceeds recommended
- 4) Ceramic or electrolytic type capacitors are recommended, tantalum type may damage converter
- 5) Parallel connections, or hot swapping is not recommended



## Derating



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