

## 2 watt dc-dc converters

- 7 PIN SIP PACKAGE
- LOW RIPPLE & NOISE
- HIGH EFFICIENCY UP TO 85%
- INPUT/OUTPUT ISOLATION : 1000, 3000, 4000 & 5200VDC
- OPERATING TEMPERATURE: -40°C ... +85°C
- PIN-COMPATIBLE WITH MULTIPLE MANUFACTURERS

## GENERAL DESCRIPTION

Our AM2D series is a family of cost effective 2W single, dual, dual separate output isolated DC-DC converters. These converters achieve low cost and ultra-miniature SIP7 pin size without compromising performance and reliability.

Two hundred sixteen models operate from input voltages of 5, 12 & 24VDC; producing output voltage levels of 3.3, 5, 7.2, 9, 12, 15, 18, 24,  $\pm 3.3$ ,  $\pm 5$ ,  $\pm 7.2$ ,  $\pm 9$ ,  $\pm 12$ ,  $\pm 15$ ,  $\pm 18$  or  $\pm 24$  VDC. Full SMD-design and a 100% production test of parameters ensures a high reliability in this product.

## ELECTRICAL SPECIFICATIONS

Specifications typical at +25°C, nominal input voltage, rated output current unless otherwise specified

### Input Specifications:

|               |            |
|---------------|------------|
| Voltage range | $\pm 10\%$ |
| Filter        | Capacitor  |

### Isolation Specifications:

|                        |                                                                      |
|------------------------|----------------------------------------------------------------------|
| Rated voltage (60 sec) | 1000VDC (all models)<br>3000, 4000 & 5200VDC<br>(single/dual output) |
| Resistance             | > 1000M $\Omega$                                                     |
| Capacitance            | 60pF, typ.                                                           |

### Output Specifications:

|                               |                                      |
|-------------------------------|--------------------------------------|
| Voltage accuracy              | $\pm 5\%$ , max.                     |
| Voltage balance (Dual Output) | $\pm 1\%$                            |
| Ripple & noise (at 20MHz BW)  | 75mVp-p, max.                        |
| Short circuit protection      | Momentary                            |
| Line voltage regulation       | $\pm 1.2\%$ / 1.0% of $V_{in}$       |
| Load voltage regulation       | $\pm 8\%$ , load=20~100%             |
| Temperature coefficient       | $\pm 0.02\%/^{\circ}\text{C}$ , typ. |

### General Specifications:

|                     |                       |
|---------------------|-----------------------|
| Efficiency          | 72% to 85%            |
| Switching frequency | 85KHz, typ. 100% load |

### Environmental Specifications:

|                                 |                     |
|---------------------------------|---------------------|
| Operating temperature (ambient) | -40°C ... +85°C     |
| Storage temperature             | -55°C ... +125°C    |
| Case temperature                | +95°C, max.         |
| Derating                        | None required       |
| Humidity (non-condensing)       | Up to 90%           |
| Cooling                         | Free-air Convection |

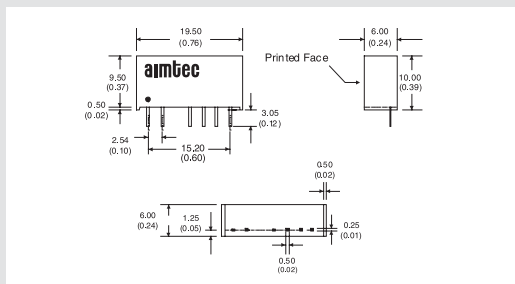
### Physical Specifications:

|               |                                            |
|---------------|--------------------------------------------|
| Dimensions    | 19.50x6.00x10.00mm<br>0.76x0.24x0.39inches |
| Weight        | 2 .5g                                      |
| Case material | Non-conductive black plastic               |

MTBF: > 688,000 hrs (MIL-HDBK-217F, Ground Benign,  $t=+25^{\circ}\text{C}$ )

Specifications are subject to change without notification

## OUTLINE DIMENSIONS & PIN CONNECTIONS



| Pin | 1000VDC   |           |               | 3000, 4000 & 5200VDC |           |
|-----|-----------|-----------|---------------|----------------------|-----------|
|     | Single    | Dual      | Dual Separate | Single               | Dual      |
| 1   | +V Input  | +V Input  | +V Input      | +V Input             | +V Input  |
| 2   | -V Input  | -V Input  | -V Input      | -V Input             | -V Input  |
| 4   | -V Output | -V Output | +V1 Output    | Omitted              | Omitted   |
| 5   | Omitted   | Common    | -V1 Output    | -V Output            | -V Output |
| 6   | +V Output | +V Output | +V2 Output    | Omitted              | Common    |
| 7   | Omitted   | Omitted   | -V2 Output    | +V Output            | +V Output |

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# AM2D Series

## MODELS Single output

DC-DC CONVERTERS

| Models            |                   |                   |                   | Input Voltage | Output Voltage | Output Current max. |
|-------------------|-------------------|-------------------|-------------------|---------------|----------------|---------------------|
| Isolation 1000VDC | Isolation 3000VDC | Isolation 4000VDC | Isolation 5200VDC |               |                |                     |
| AM2D-0503S        | AM2D-0503SH30     | AM2D-0503SH40     | AM2D-0503SH52     | 5V±10%        | 3.3VDC         | 400mA               |
| AM2D-0505S        | AM2D-0505SH30     | AM2D-0505SH40     | AM2D-0505SH52     |               | 5VDC           | 400mA               |
| AM2D-0507S        | AM2D-0507SH30     | AM2D-0507SH40     | AM2D-0507SH52     |               | 7.2VDC         | 278mA               |
| AM2D-0509S        | AM2D-0509SH30     | AM2D-0509SH40     | AM2D-0509SH52     |               | 9VDC           | 222mA               |
| AM2D-0512S        | AM2D-0512SH30     | AM2D-0512SH40     | AM2D-0512SH52     |               | 12VDC          | 167mA               |
| AM2D-0515S        | AM2D-0515SH30     | AM2D-0515SH40     | AM2D-0515SH52     |               | 15VDC          | 134mA               |
| AM2D-0518S        | AM2D-0518SH30     | AM2D-0518SH40     | AM2D-0518SH52     |               | 18VDC          | 111mA               |
| AM2D-0524S        | AM2D-0524SH30     | AM2D-0524SH40     | AM2D-0524SH52     |               | 24VDC          | 83mA                |
| AM2D-1203S        | AM2D-1203SH30     | AM2D-1203SH40     | AM2D-1203SH52     | 12V±10%       | 3.3VDC         | 400mA               |
| AM2D-1205S        | AM2D-1205SH30     | AM2D-1205SH40     | AM2D-1205SH52     |               | 5VDC           | 400mA               |
| AM2D-1207S        | AM2D-1207SH30     | AM2D-1207SH40     | AM2D-1207SH52     |               | 7.2VDC         | 278mA               |
| AM2D-1209S        | AM2D-1209SH30     | AM2D-1209SH40     | AM2D-1209SH52     |               | 9VDC           | 222mA               |
| AM2D-1212S        | AM2D-1212SH30     | AM2D-1212SH40     | AM2D-1212SH52     |               | 12VDC          | 167mA               |
| AM2D-1215S        | AM2D-1215SH30     | AM2D-1215SH40     | AM2D-1215SH52     |               | 15VDC          | 134mA               |
| AM2D-1218S        | AM2D-1218SH30     | AM2D-1218SH40     | AM2D-1218SH52     |               | 18VDC          | 111mA               |
| AM2D-1224S        | AM2D-1224SH30     | AM2D-1224SH40     | AM2D-1224SH52     |               | 24VDC          | 83mA                |
| AM2D-2403S        | AM2D-2403SH30     | AM2D-2403SH40     | AM2D-2403SH52     | 24V±10%       | 3.3VDC         | 400mA               |
| AM2D-2405S        | AM2D-2405SH30     | AM2D-2405SH40     | AM2D-2405SH52     |               | 5VDC           | 400mA               |
| AM2D-2407S        | AM2D-2407SH30     | AM2D-2407SH40     | AM2D-2407SH52     |               | 7.2VDC         | 278mA               |
| AM2D-2409S        | AM2D-2409SH30     | AM2D-2409SH40     | AM2D-2409SH52     |               | 9VDC           | 222mA               |
| AM2D-2412S        | AM2D-2412SH30     | AM2D-2412SH40     | AM2D-2412SH52     |               | 12VDC          | 167mA               |
| AM2D-2415S        | AM2D-2415SH30     | AM2D-2415SH40     | AM2D-2415SH52     |               | 15VDC          | 134mA               |
| AM2D-2418S        | AM2D-2418SH30     | AM2D-2418SH40     | AM2D-2418SH52     |               | 18VDC          | 111mA               |
| AM2D-2424S        | AM2D-2424SH30     | AM2D-2424SH40     | AM2D-2424SH52     |               | 24VDC          | 83mA                |

## Dual output

| Models            |                   |                   |                   | Input Voltage | Output Voltage | Output Current max. |
|-------------------|-------------------|-------------------|-------------------|---------------|----------------|---------------------|
| Isolation 1000VDC | Isolation 3000VDC | Isolation 4000VDC | Isolation 5200VDC |               |                |                     |
| AM2D-0503D        | AM2D-0503DH30     | AM2D-0503DH40     | AM2D-0503DH52     | 5V±10%        | ±3.3VDC        | ±200mA              |
| AM2D-0505D        | AM2D-0505DH30     | AM2D-0505DH40     | AM2D-0505DH52     |               | ±5VDC          | ±200mA              |
| AM2D-0507D        | AM2D-0507DH30     | AM2D-0507DH40     | AM2D-0507DH52     |               | ±7.2VDC        | ±139mA              |
| AM2D-0509D        | AM2D-0509DH30     | AM2D-0509DH40     | AM2D-0509DH52     |               | ±9VDC          | ±111mA              |
| AM2D-0512D        | AM2D-0512DH30     | AM2D-0512DH40     | AM2D-0512DH52     |               | ±12VDC         | ±83mA               |
| AM2D-0515D        | AM2D-0515DH30     | AM2D-0515DH40     | AM2D-0515DH52     |               | ±15VDC         | ±67mA               |
| AM2D-0518D        | AM2D-0518DH30     | AM2D-0518DH40     | AM2D-0518DH52     |               | ±18VDC         | ±55mA               |
| AM2D-0524D        | AM2D-0524DH30     | AM2D-0524DH40     | AM2D-0524DH52     |               | ±24VDC         | ±42mA               |
| AM2D-1203D        | AM2D-1203DH30     | AM2D-1203DH40     | AM2D-1203DH52     | 12V±10%       | ±3.3VDC        | ±200mA              |
| AM2D-1205D        | AM2D-1205DH30     | AM2D-1205DH40     | AM2D-1205DH52     |               | ±5VDC          | ±200mA              |
| AM2D-1207D        | AM2D-1207DH30     | AM2D-1207DH40     | AM2D-1207DH52     |               | ±7.2VDC        | ±139mA              |
| AM2D-1209D        | AM2D-1209DH30     | AM2D-1209DH40     | AM2D-1209DH52     |               | ±9VDC          | ±111mA              |
| AM2D-1212D        | AM2D-1212DH30     | AM2D-1212DH40     | AM2D-1212DH52     |               | ±12VDC         | ±83mA               |

## MODELS

### Dual output (continued)

| Models            |                   |                   |                   | Input Voltage | Ouput Voltage | Ouput Current max. |
|-------------------|-------------------|-------------------|-------------------|---------------|---------------|--------------------|
| Isolation 1000VDC | Isolation 3000VDC | Isolation 4000VDC | Isolation 5200VDC |               |               |                    |
| AM2D-1215D        | AM2D-1215DH30     | AM2D-1215DH40     | AM2D-1215DH52     | 12V±10%       | ±15VDC        | ±67mA              |
| AM2D-1218D        | AM2D-1218DH30     | AM2D-1218DH40     | AM2D-1218DH52     |               | ±18VDC        | ±55mA              |
| AM2D-1224D        | AM2D-1224DH30     | AM2D-1224DH40     | AM2D-1224DH52     |               | ±24VDC        | ±42mA              |
| AM2D-2403D        | AM2D-2403DH30     | AM2D-2403DH40     | AM2D-2403DH52     | 24V±10%       | ±3.3VDC       | ±200mA             |
| AM2D-2405D        | AM2D-2405DH30     | AM2D-2405DH40     | AM2D-2405DH52     |               | ±5VDC         | ±200mA             |
| AM2D-2407D        | AM2D-2407DH30     | AM2D-2407DH40     | AM2D-2407DH52     |               | ±7.2VDC       | ±139mA             |
| AM2D-2409D        | AM2D-2409DH30     | AM2D-2409DH40     | AM2D-2409DH52     |               | ±9VDC         | ±111mA             |
| AM2D-2412D        | AM2D-2412DH30     | AM2D-2412DH40     | AM2D-2412DH52     |               | ±12VDC        | ±83mA              |
| AM2D-2415D        | AM2D-2415DH30     | AM2D-2415DH40     | AM2D-2415DH52     |               | ±15VDC        | ±67mA              |
| AM2D-2418D        | AM2D-2418DH30     | AM2D-2418DH40     | AM2D-2418DH52     |               | ±18VDC        | ±55mA              |
| AM2D-2424D        | AM2D-2424DH30     | AM2D-2424DH40     | AM2D-2424DH52     |               | ±24VDC        | ±42mA              |

### Dual separate output

| Models            | Input Voltage | Ouput Voltage | Ouput Current max. |
|-------------------|---------------|---------------|--------------------|
| Isolation 1000VDC |               |               |                    |
| AM2D-050303D      | 5V±10%        | 3.3/3.3VDC    | 200/200mA          |
| AM2D-050505D      |               | 5/5VDC        | 200/200mA          |
| AM2D-050707D      |               | 7.2/7.2VDC    | 139/139mA          |
| AM2D-050909D      |               | 9/9VDC        | 111/111mA          |
| AM2D-051212D      |               | 12/12VDC      | 83/83mA            |
| AM2D-051515D      |               | 15/15VDC      | 67/67mA            |
| AM2D-051818D      |               | 18/18VDC      | 55/55mA            |
| AM2D-052424D      |               | 24/24VDC      | 42/42mA            |
| AM2D-120303D      | 12V±10%       | 3.3/3.3VDC    | 200/200mA          |
| AM2D-120505D      |               | 5/5VDC        | 200/200mA          |
| AM2D-120707D      |               | 7.2/7.2VDC    | 139/139mA          |
| AM2D-120909D      |               | 9/9VDC        | 111/111mA          |
| AM2D-121212D      |               | 12/12VDC      | 83/83mA            |
| AM2D-121515D      |               | 15/15VDC      | 67/67mA            |
| AM2D-121818D      |               | 18/18VDC      | 55/55mA            |
| AM2D-122424D      |               | 24/24VDC      | 42/42mA            |
| AM2D-240303D      | 24V±10%       | 3.3/3.3VDC    | 200/200mA          |
| AM2D-240505D      |               | 5/5VDC        | 200/200mA          |
| AM2D-240707D      |               | 7.2/7.2VDC    | 139/139mA          |
| AM2D-240909D      |               | 9/9VDC        | 111/111mA          |
| AM2D-241212D      |               | 12/12VDC      | 83/83mA            |
| AM2D-241515D      |               | 15/15VDC      | 67/67mA            |
| AM2D-241818D      |               | 18/18VDC      | 55/55mA            |
| AM2D-242424D      |               | 24/24VDC      | 42/42mA            |