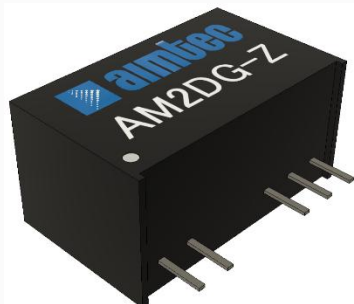


## AM2DG-Z

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samples



SIP7

The new AM2DG-Z is an ultra-wide input DC/DC converter that has a dual isolated output channel, which leads to improved reliability and performance. This series will offer many benefits to your design if it requires several voltage supply rails being supplied by one component.

This series offers great operating temperatures, from -40°C to +95°C with full power up to 90°C. It also features an isolation of 5000VAC for improved reliability and system safety. Furthermore, a high MTBF of 2,600,000h, continuous output short circuit protection (OSCP), over-current protection (OCP), over-voltage protection (OVP), and under voltage lock-out (UVLO) come standard with the series.

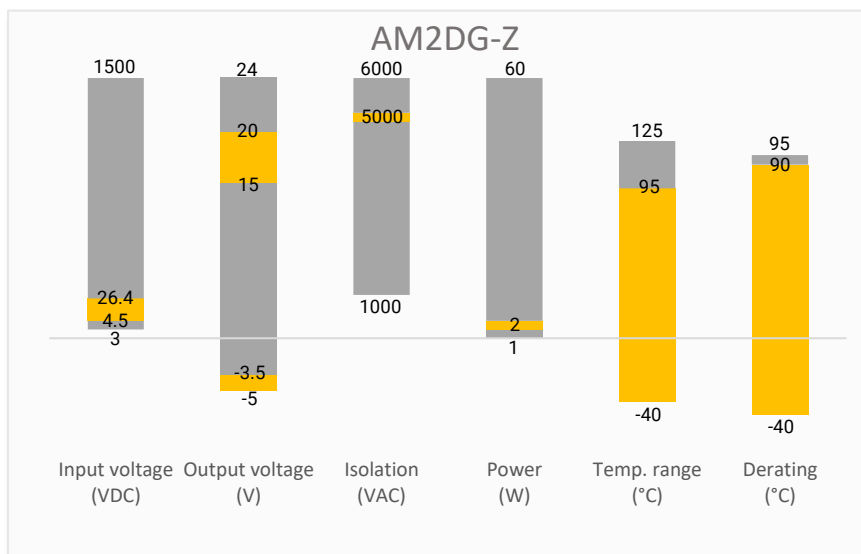
The AM2DG-Z is great for distributed power supply systems, industrial controls, power grid, instruments and communications applications.

## Features

- Operating Temp: -40 °C to +95 °C
- High isolation voltage: 5000VAC
- Low ripple & noise, 75mV (p-p), typ.
- SIP7 package
- Output short circuit, over-current, over-voltage, input under voltage protection
- Suitable for IGBT and SiC applications



## Summary



## Training



Product Training Video  
(click to open)



Press Release

Coming Soon!

Application Notes

## Applications



Power Grid



Industrial



Telecom



Instrumentation

## Models & Specifications



| Dual Output       |                     |                         |           |                      |      |                         |                          |                              |                               |
|-------------------|---------------------|-------------------------|-----------|----------------------|------|-------------------------|--------------------------|------------------------------|-------------------------------|
| Model             | Input Voltage (VDC) | Input Current Typ. (mA) |           | Output Voltage (VDC) |      | Output Current Max (mA) |                          | Maximum Capacitive Load (μF) | Efficiency Full Load Typ. (%) |
|                   |                     | No Load                 | Full Load | Vo1                  | Vo2  | Io1                     | Io2                      |                              |                               |
| AM2DG-051503DA50Z | 5 (4.5-5.5)         | 40                      | 494       | 15                   | -3.5 | 66 (1W)<br>100 (1.5W)   | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 81                            |
| AM2DG-051505DA50Z | 5 (4.5-5.5)         | 40                      | 482       | 15                   | -5   | 66 (1W)<br>100 (1.5W)   | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 83                            |
| AM2DG-051803DA50Z | 5 (4.5-5.5)         | 40                      | 484       | 18                   | -3.5 | 55 (1W)<br>80 (1.5W)    | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 81                            |
| AM2DG-051805DA50Z | 5 (4.5-5.5)         | 40                      | 482       | 18                   | -5   | 55 (1W)<br>80 (1.5W)    | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 83                            |
| AM2DG-052003DA50Z | 5 (4.5-5.5)         | 40                      | 488       | 20                   | -3.5 | 50 (1W)<br>80 (1.5W)    | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 82                            |
| AM2DG-052005DA50Z | 5 (4.5-5.5)         | 40                      | 482       | 20                   | -5   | 50 (1W)<br>80 (1.5W)    | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 83                            |
| AM2DG-121503DA50Z | 12 (10.8-13.2)      | 25                      | 199       | 15                   | -3.5 | 66 (1W)<br>100 (1.5W)   | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-121505DA50Z | 12 (10.8-13.2)      | 25                      | 194       | 15                   | -5   | 66 (1W)<br>100 (1.5W)   | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |
| AM2DG-121803DA50Z | 12 (10.8-13.2)      | 25                      | 199       | 18                   | -3.5 | 55 (1W)<br>80 (1.5W)    | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-121805DA50Z | 12 (10.8-13.2)      | 25                      | 194       | 18                   | -5   | 55 (1W)<br>80 (1.5W)    | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |
| AM2DG-122003DA50Z | 12 (10.8-13.2)      | 25                      | 199       | 20                   | -3.5 | 50 (1W)<br>80 (1.5W)    | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-122005DA50Z | 12 (10.8-13.2)      | 25                      | 194       | 20                   | -5   | 50 (1W)<br>80 (1.5W)    | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |
| AM2DG-151503DA50Z | 15 (13.5-16.5)      | 20                      | 159       | 15                   | -3.5 | 66 (1W)<br>100 (1.5W)   | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-151505DA50Z | 15 (13.5-16.5)      | 20                      | 155       | 15                   | -5   | 66 (1W)<br>100 (1.5W)   | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |
| AM2DG-151803DA50Z | 15 (13.5-16.5)      | 20                      | 159       | 18                   | -3.5 | 55 (1W)<br>80 (1.5W)    | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-151805DA50Z | 15 (13.5-16.5)      | 20                      | 155       | 18                   | -5   | 55 (1W)<br>80 (1.5W)    | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |
| AM2DG-152003DA50Z | 15 (13.5-16.5)      | 20                      | 158       | 20                   | -3.5 | 50 (1W)<br>80 (1.5W)    | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-152005DA50Z | 15 (13.5-16.5)      | 20                      | 155       | 20                   | -5   | 50 (1W)<br>80 (1.5W)    | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |
| AM2DG-241503DA50Z | 24 (21.6-26.4)      | 15                      | 99        | 15                   | -3.5 | 66 (1W)<br>100 (1.5W)   | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-241505DA50Z | 24 (21.6-26.4)      | 15                      | 97        | 15                   | -5   | 66 (1W)<br>100 (1.5W)   | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |
| AM2DG-241803DA50Z | 24 (21.6-26.4)      | 15                      | 99        | 18                   | -3.5 | 55 (1W)<br>80 (1.5W)    | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-241805DA50Z | 24 (21.6-26.4)      | 15                      | 97        | 18                   | -5   | 55 (1W)<br>80 (1.5W)    | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |
| AM2DG-242003DA50Z | 24 (21.6-26.4)      | 15                      | 99        | 20                   | -3.5 | 50 (1W)<br>80 (1.5W)    | -300 (1W)<br>-140 (0.5W) | 47 / -470                    | 84                            |
| AM2DG-242005DA50Z | 24 (21.6-26.4)      | 15                      | 97        | 20                   | -5   | 50 (1W)<br>80 (1.5W)    | -200 (1W)<br>-80 (0.5W)  | 47 / -470                    | 86                            |

| Input Specification                                                                                         |                             |                     |         |                   |
|-------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------|---------|-------------------|
| Parameters                                                                                                  | Conditions                  | Typical             | Maximum | Units             |
| Under voltage protection                                                                                    | 5Vin                        | > 3                 | 4.3     | VDC               |
|                                                                                                             | 12Vin                       | > 8                 | 10.5    | VDC               |
|                                                                                                             | 15Vin                       | > 11                | 13      | VDC               |
|                                                                                                             | 24Vin                       | > 18                | 21      | VDC               |
| Absolute maximum rating                                                                                     | 5Vin                        | --                  | 5.7     | VDC               |
|                                                                                                             | 12Vin                       | --                  | 14      | VDC               |
|                                                                                                             | 15Vin                       | --                  | 17      | VDC               |
|                                                                                                             | 24Vin                       | --                  | 27      | VDC               |
| Over voltage protection                                                                                     | 5Vin                        | > 5.7               | 6.5     | VDC               |
|                                                                                                             | 12Vin                       | > 14                | 15.5    | VDC               |
|                                                                                                             | 15Vin                       | > 17                | 20      | VDC               |
|                                                                                                             | 24Vin                       | > 27                | 31      | VDC               |
| Recommended input fuse                                                                                      | 5Vin                        | 1.0(slow blow type) |         | A                 |
|                                                                                                             | 12Vin                       | 0.4(slow blow type) |         | A                 |
|                                                                                                             | 15Vin                       | 0.4(slow blow type) |         | A                 |
|                                                                                                             | 24Vin                       | 0.2(slow blow type) |         | A                 |
| Reflected ripple Current*                                                                                   | Nominal input and full load | 20                  | --      | mA <sub>p-p</sub> |
| Filter                                                                                                      | Capacitance Filter          |                     |         |                   |
| * Measured with a simulated source inductance of 22μH and a source capacitor Cin(47μF, ESR<1.0Ω at 100kHz). |                             |                     |         |                   |

| Output Specification          |                                           |         |         |                   |
|-------------------------------|-------------------------------------------|---------|---------|-------------------|
| Parameters                    | Conditions                                | Typical | Maximum | Units             |
| Voltage accuracy              | 3.5Vout                                   | > -7    | 3       | %                 |
|                               | Others                                    | > -4    | 3       | %                 |
| Line regulation               | For 1% Vin change                         | --      | ± 1.3   | %                 |
| Load regulation               | 10% - 100%, 5Vin, Positive output voltage | --      | 15      | %                 |
|                               | 10% - 100%, 5Vin, Negative output voltage | --      | 18      | %                 |
|                               | 10% - 100%, others Vin, -3.5Vout          | --      | 13      | %                 |
|                               | 10% - 100%, others                        | --      | 10      | %                 |
|                               | 0% - 100% load                            | ----    | 40      | %                 |
| Ripple & Noise*               | 20MHz bandwidth, Positive output voltage  | 75      | --      | mV <sub>p-p</sub> |
|                               | 20MHz bandwidth, Negative output voltage  | 50      | --      | mV <sub>p-p</sub> |
| * Measured with a 0.1μF MLCC. |                                           |         |         |                   |

| Isolation Specification  |                           |         |         |       |
|--------------------------|---------------------------|---------|---------|-------|
| Parameters               | Conditions                | Typical | Maximum | Units |
| Tested isolation voltage | Input / output, 60 sec    | ≥ 5000  | --      | VAC   |
| Resistance               | --                        | ≥ 1000  | --      | MΩ    |
| Capacitance              | --                        | --      | 10      | pF    |
| CMTI                     | 1.5KV common mode voltage | ≥ 100   | --      | kV/μs |
| Leakage Current          | 250VAC,60Hz               | 2       | --      | μA    |

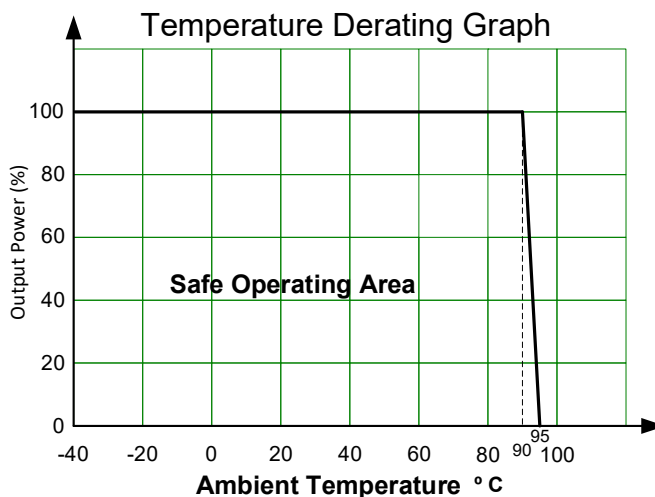
## General Specifications

| Parameters                                                                                                                                                                          | Conditions                                              | Typical     | Maximum | Units     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------|---------|-----------|
| Overvoltage category                                                                                                                                                                | OVC II                                                  |             |         |           |
| Switching frequency                                                                                                                                                                 | --                                                      | 200         | --      | KHz       |
| Over Current protection                                                                                                                                                             | --                                                      | ≥ 120       | 170     | % of Iout |
| Short circuit protection                                                                                                                                                            | Continues, Auto recovery                                |             |         |           |
| Operating temperature                                                                                                                                                               | With derating at 90°C                                   | -40 to +95  | --      | °C        |
| Storage temperature                                                                                                                                                                 | --                                                      | -55 to +125 | --      | °C        |
| Soldering temperature                                                                                                                                                               | 1.5mm distance ≤ 10s                                    | --          | 260     | °C        |
| Case temperature                                                                                                                                                                    | --                                                      | --          | 115     | °C        |
| Temperature coefficient                                                                                                                                                             | --                                                      | --          | ± 0.03  | %/ °C     |
| Altitude application                                                                                                                                                                | See power derating                                      | --          | 5000    | m         |
| Cooling                                                                                                                                                                             | Natural convection(30-65 LFM)                           |             |         |           |
| Humidity                                                                                                                                                                            | Non-condensing                                          | --          | 95      | % RH      |
| Case material                                                                                                                                                                       | Heat resistant black Plastic (flammability to UL 94V-0) |             |         |           |
| Weight                                                                                                                                                                              | --                                                      | 4.2         | --      | g         |
| Dimensions (L x W x H)                                                                                                                                                              | 0.77 x 0.39 x 0.49 inches (19.50 × 9.80 × 12.50 mm)     |             |         |           |
| MTBF                                                                                                                                                                                | > 2 600 000 hrs (MIL-HDBK -217F, 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 |                                          |                                                                   |
|------------|------------------------------------------|-------------------------------------------------------------------|
| Standards  | Information technology Equipment         | Designed to meet IEC/EN/ UL 62368-1                               |
|            | EMC - Conducted and radiated emission    | EN55032, class B (with the recommended EMC circuit)               |
|            | Electrostatic Discharge Immunity         | IEC 61000-4-2 Air ±15KV, Criteria A                               |
|            | RF, Electromagnetic Field Immunity       | IEC 61000-4-3 10V/m, Criteria A                                   |
|            | Electrical Fast Transient/Burst Immunity | IEC 61000-4-4 ±2KV, Criteria A (with the recommended EMC circuit) |
|            | Surge Immunity                           | IEC 61000-4-5 ±2KV, Criteria A (with the recommended EMC circuit) |
|            | RF, Conducted Disturbance Immunity       | IEC 61000-4-6 10Vr.m.s, Criteria A                                |
|            | Power-frequency Magnetic Field Immunity  | IEC 61000-4-8 100A/m, Criteria A                                  |

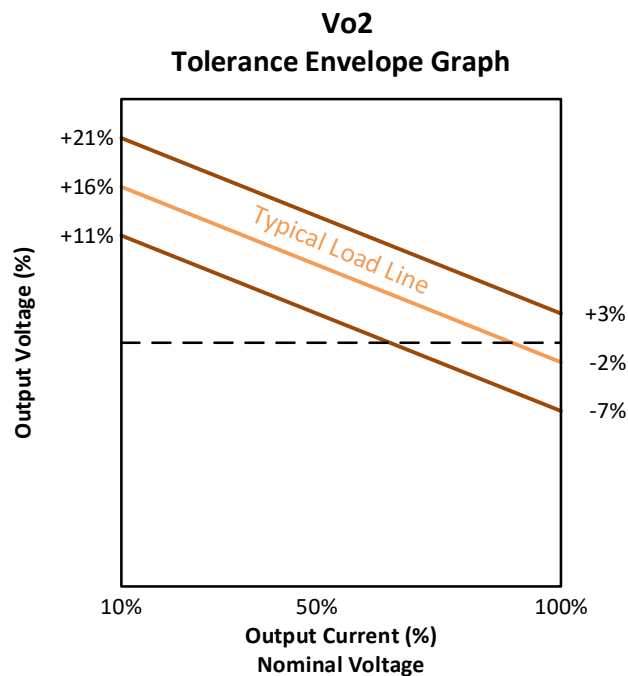
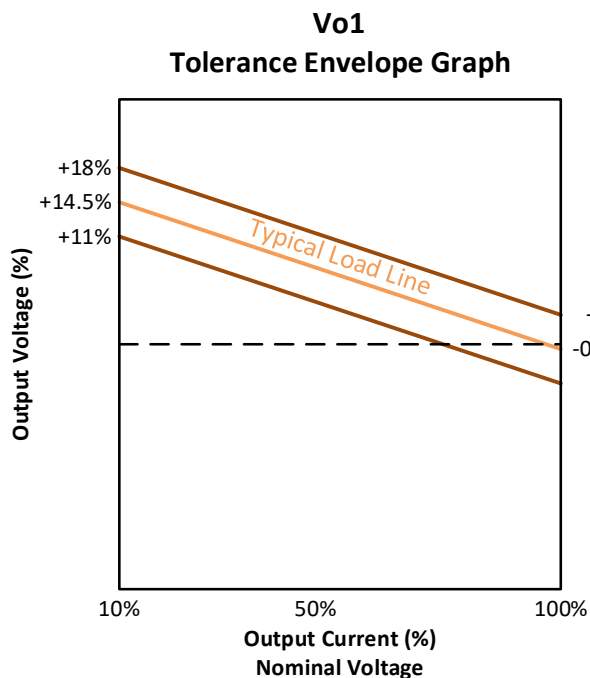
## Derating



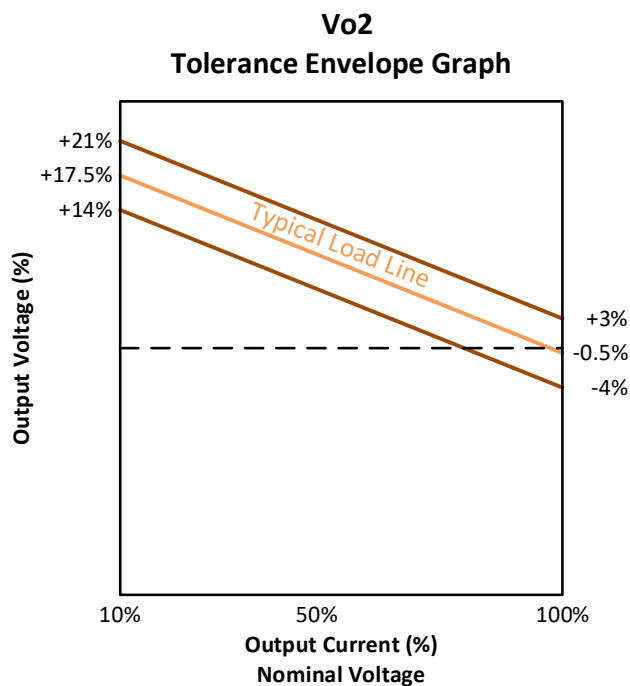
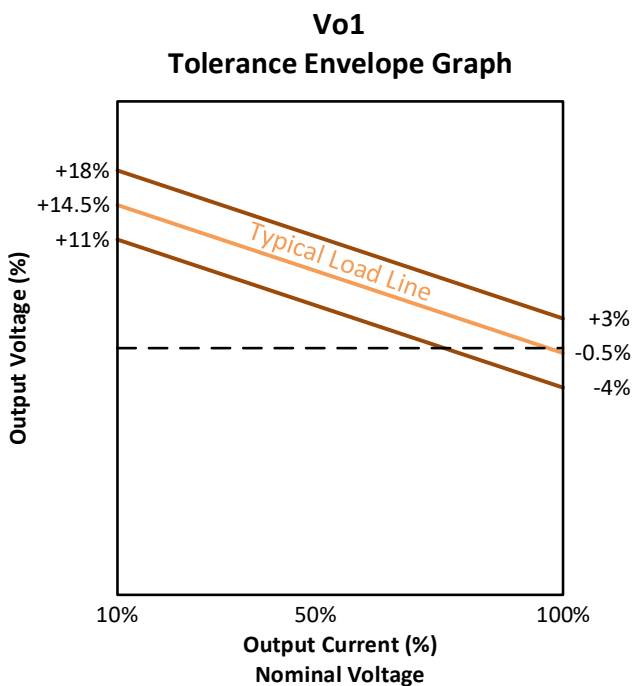
## Typical Characteristic



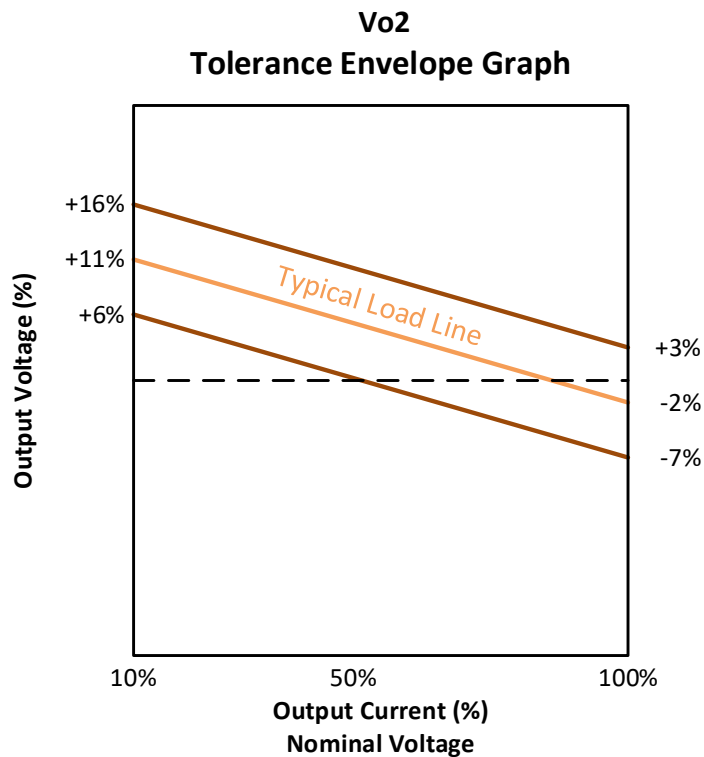
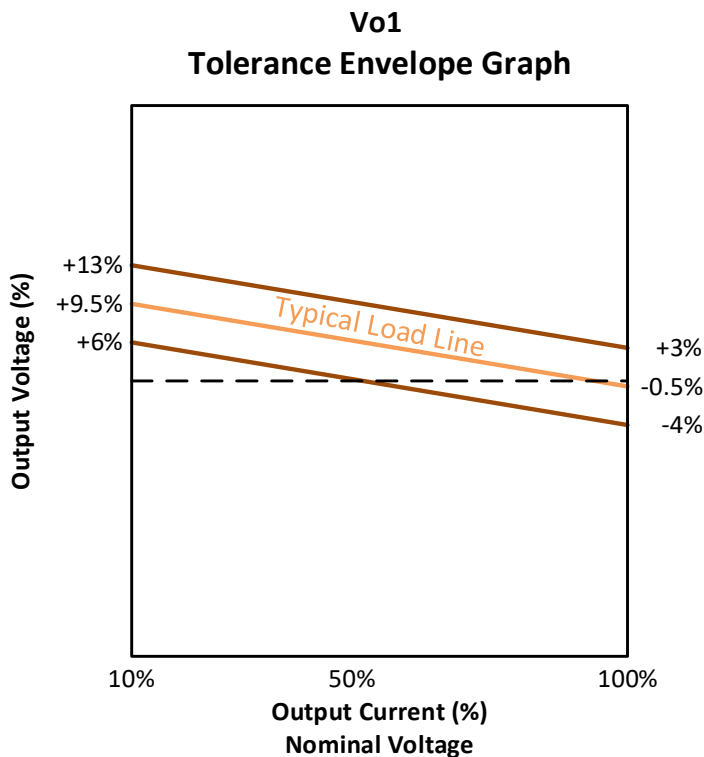
### For 5Vin, -3.5Vout models



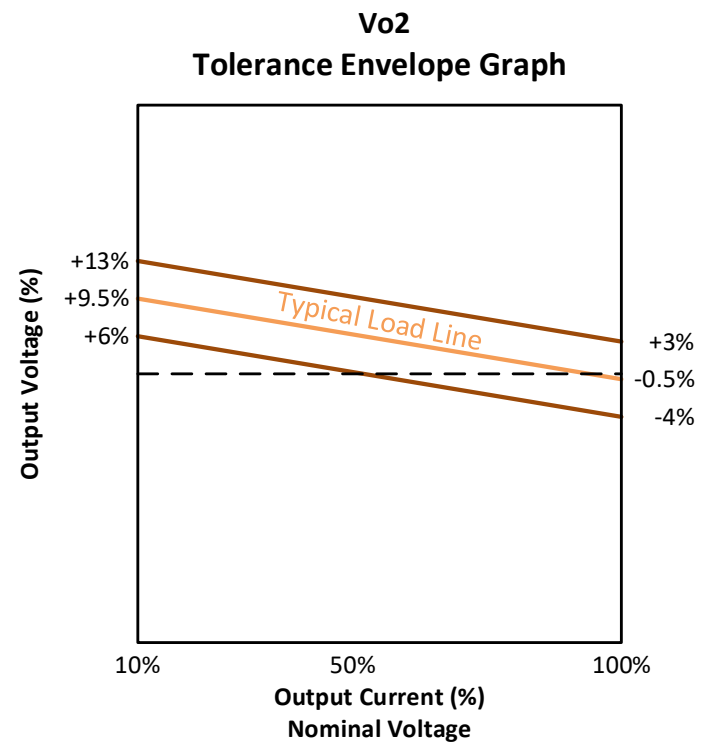
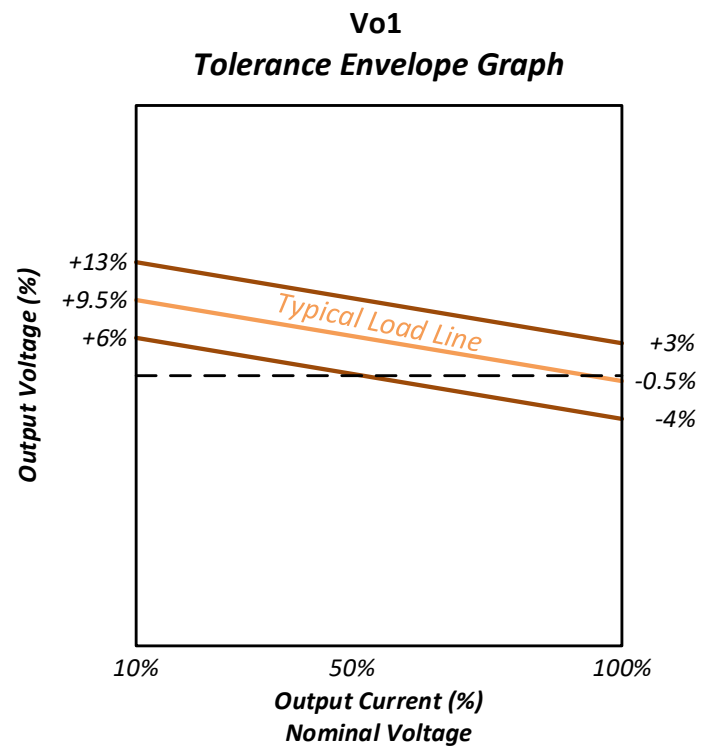
### For 5Vin, -5Vout models



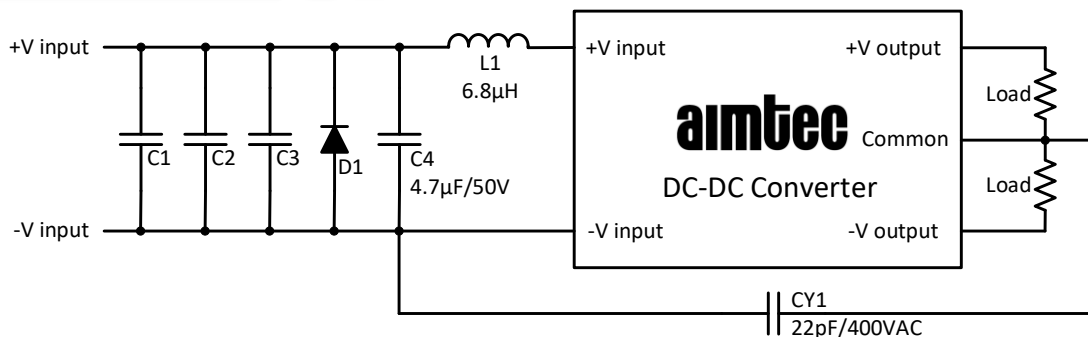
For Other  $V_{in}$ , -3.5V $_{out}$  models



For Other  $V_{in}$ , -5V $_{out}$  models



## EMC Application Circuit

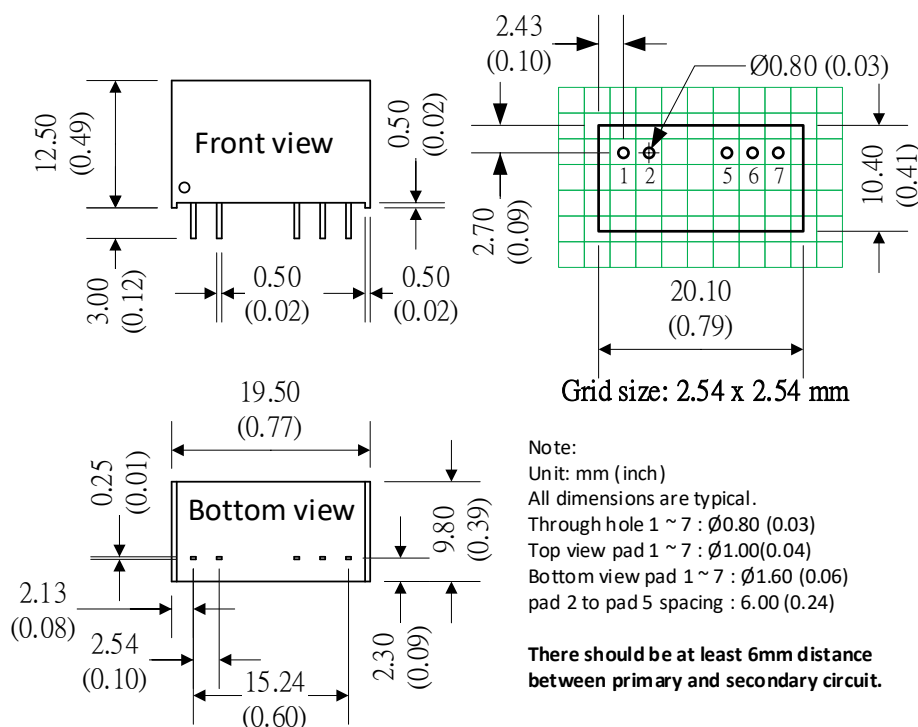


| Model | C1         | C2         | C3         | D1        |
|-------|------------|------------|------------|-----------|
| 5Vin  | 680μF/100V | 680μF/100V | 680μF/100V | SMDJ8.0A  |
| 12Vin | 680μF/100V | 470μF/100V |            | SMDJ16.0A |
| 15Vin | 680μF/100V | 470μF/100V |            | SMDJ18.0A |
| 24Vin | 680μF/100V |            |            | SMDJ28.0A |

Note :

- Components C1, C2, C3, and D1 in the circuit are used to meet surge and EFT test requirements.
- Components C4, L1, and CY1 in the circuit are used to meet EMI test requirements.

## Dimensions



| Pin Out Specifications |             |
|------------------------|-------------|
| Pin                    | Dual        |
| 1                      | +V Input    |
| 2                      | -V Input    |
| 5                      | -V Output 2 |
| 6                      | Com         |
| 7                      | +V Output 1 |

**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).