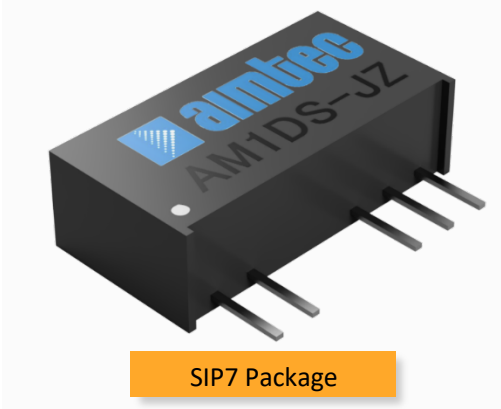


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**AM1DS-JZ**



The AM1DS-JZ is a 1W SIP7 DC/DC converter that offers great cost savings thanks to an improved manufacturing process. It also features excellent reliability and performance while offering a standard input voltage range of 3.3-24VDC as well as an output voltage of 3.3-24V. This compact SIP7 design will surely benefit your new system design.

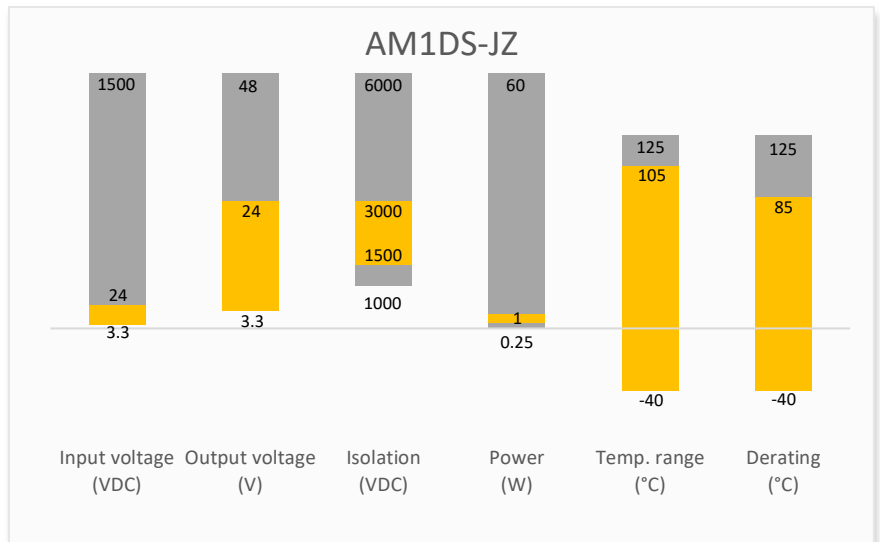
This new series offers great operating temperatures, from -40 to 105°C with full power up to 85°C. Also, an isolation of 1500 or 3000VDC for improved reliability and system safety as well as a great 3,500,000h MTBF come standard.

The AM1DS-JZ is suitable for instrumentation, industrial controls, industrial applications, communication and IoT applications.


**Features**

- High I/O Isolation of 1500/3000VDC
- Continuous Short circuit protection
- Operating Temp: -40 °C to +105 °C
- Industry standard SIP7 pin-out
- Efficiency up to 85%
- Unregulated output


**Summary**



**Training**



Product Training Video  
(click to open)



Press Release

Coming Soon!

Application Notes

**Applications**



## Models & Specifications



| Single Output      |                     |                      |  |                                |                 |                              |                     |
|--------------------|---------------------|----------------------|--|--------------------------------|-----------------|------------------------------|---------------------|
| Model              | Input Voltage (VDC) | Output Voltage (VDC) | Input Current Full   No load typ. (mA) | Output Current max   min (mA)* | Isolation (VDC) | Maximum capacitive Load (μF) | Efficiency Typ. (%) |
| AM1DS-0303SJZ ✖    | 3.3 (2.97-3.63)     | 3.3                  | 384 / 10                               | 303 / 30                       | 1500            | 2400                         | 79                  |
| AM1DS-0305SJZ ✖    | 3.3 (2.97-3.63)     | 5                    | 370 / 18                               | 200 / 20                       | 1500            | 2400                         | 82                  |
| AM1DS-0309SJZ ✖    | 3.3 (2.97-3.63)     | 9                    | 370 / 18                               | 111 / 11                       | 1500            | 1000                         | 85                  |
| AM1DS-0312SJZ ✖    | 3.3 (2.97-3.63)     | 12                   | 370 / 18                               | 83 / 8                         | 1500            | 560                          | 82                  |
| AM1DS-0315SJZ ✖    | 3.3 (2.97-3.63)     | 15                   | 370 / 18                               | 67 / 7                         | 1500            | 560                          | 82                  |
| AM1DS-0324SJZ ✖    | 3.3 (2.97-3.63)     | 24                   | 370 / 18                               | 42 / 4                         | 1500            | 220                          | 84                  |
| AM1DS-0503SJZ ✖    | 5 (4.5-5.5)         | 3.3                  | 270 / 5                                | 303 / 30                       | 1500            | 2400                         | 74                  |
| AM1DS-0505SJZ      | 5 (4.5-5.5)         | 5                    | 270 / 5                                | 200 / 20                       | 1500            | 2400                         | 82                  |
| AM1DS-0509SJZ ✖    | 5 (4.5-5.5)         | 9                    | 241 / 12                               | 111 / 12                       | 1500            | 1000                         | 83                  |
| AM1DS-0512SJZ ✖    | 5 (4.5-5.5)         | 12                   | 241 / 12                               | 84 / 9                         | 1500            | 560                          | 83                  |
| AM1DS-0515SJZ ✖    | 5 (4.5-5.5)         | 15                   | 241 / 18                               | 67 / 7                         | 1500            | 560                          | 83                  |
| AM1DS-0524SJZ ✖    | 5 (4.5-5.5)         | 24                   | 241 / 18                               | 42 / 4                         | 1500            | 220                          | 85                  |
| AM1DS-1203SJZ      | 12 (10.8-13.2)      | 3.3                  | 105 / 8                                | 303 / 30                       | 1500            | 2400                         | 75                  |
| AM1DS-1205SJZ      | 12 (10.8-13.2)      | 5                    | 105 / 8                                | 200 / 20                       | 1500            | 2400                         | 80                  |
| AM1DS-1209SJZ      | 12 (10.8-13.2)      | 9                    | 105 / 8                                | 111 / 12                       | 1500            | 1000                         | 80                  |
| AM1DS-1212SJZ      | 12 (10.8-13.2)      | 12                   | 105 / 8                                | 83 / 9                         | 1500            | 560                          | 80                  |
| AM1DS-1215SJZ      | 12 (10.8-13.2)      | 15                   | 105 / 8                                | 67 / 7                         | 1500            | 560                          | 81                  |
| AM1DS-1224SJZ      | 12 (10.8-13.2)      | 24                   | 105 / 8                                | 42 / 4                         | 1500            | 220                          | 81                  |
| AM1DS-1505SJZ      | 15 (13.5-16.5)      | 5                    | 84 / 8                                 | 200 / 20                       | 1500            | 2400                         | 80                  |
| AM1DS-1509SJZ      | 15 (13.5-16.5)      | 9                    | 84 / 8                                 | 111 / 12                       | 1500            | 1000                         | 80                  |
| AM1DS-1512SJZ      | 15 (13.5-16.5)      | 12                   | 84 / 8                                 | 83 / 9                         | 1500            | 560                          | 80                  |
| AM1DS-1515SJZ      | 15 (13.5-16.5)      | 15                   | 84 / 8                                 | 67 / 7                         | 1500            | 560                          | 81                  |
| AM1DS-1524SJZ ✖    | 15 (13.5-16.5)      | 24                   | 84 / 8                                 | 42 / 5                         | 1500            | 220                          | 81                  |
| AM1DS-2403SJZ      | 24 (21.6-26.4)      | 3.3                  | 56 / 8                                 | 303 / 30                       | 1500            | 2400                         | 75                  |
| AM1DS-2405SJZ      | 24 (21.6-26.4)      | 5                    | 56 / 8                                 | 200 / 20                       | 1500            | 2400                         | 79                  |
| AM1DS-2407SJZ ✖    | 24 (21.6-26.4)      | 7.2                  | 56 / 8                                 | 139 / 13                       | 1500            | 1000                         | 80                  |
| AM1DS-2409SJZ      | 24 (21.6-26.4)      | 9                    | 56 / 8                                 | 111 / 12                       | 1500            | 1000                         | 80                  |
| AM1DS-2412SJZ      | 24 (21.6-26.4)      | 12                   | 56 / 8                                 | 83 / 9                         | 1500            | 560                          | 81                  |
| AM1DS-2415SJZ      | 24 (21.6-26.4)      | 15                   | 56 / 8                                 | 67 / 7                         | 1500            | 560                          | 81                  |
| AM1DS-2424SJZ      | 24 (21.6-26.4)      | 24                   | 56 / 8                                 | 42 / 4                         | 1500            | 220                          | 81                  |
| AM1DS-0303SH30JZ ✖ | 3.3 (2.97-3.63)     | 3.3                  | 384 / 10                               | 303 / 30                       | 3000            | 2400                         | 79                  |
| AM1DS-0305SH30JZ ✖ | 3.3 (2.97-3.63)     | 5                    | 370 / 18                               | 200 / 20                       | 3000            | 2400                         | 82                  |
| AM1DS-0309SH30JZ ✖ | 3.3 (2.97-3.63)     | 9                    | 370 / 18                               | 111 / 11                       | 3000            | 1000                         | 85                  |
| AM1DS-0312SH30JZ ✖ | 3.3 (2.97-3.63)     | 12                   | 370 / 18                               | 83 / 8                         | 3000            | 560                          | 82                  |
| AM1DS-0315SH30JZ ✖ | 3.3 (2.97-3.63)     | 15                   | 370 / 18                               | 67 / 7                         | 3000            | 560                          | 82                  |
| AM1DS-0324SH30JZ ✖ | 3.3 (2.97-3.63)     | 24                   | 370 / 18                               | 42 / 4                         | 3000            | 220                          | 84                  |
| AM1DS-0503SH30JZ ✖ | 5 (4.5-5.5)         | 3.3                  | 270 / 5                                | 303 / 30                       | 3000            | 2400                         | 74                  |
| AM1DS-0505SH30JZ ✖ | 5 (4.5-5.5)         | 5                    | 270 / 5                                | 200 / 20                       | 3000            | 2400                         | 82                  |
| AM1DS-0509SH30JZ ✖ | 5 (4.5-5.5)         | 9                    | 241 / 12                               | 111 / 12                       | 3000            | 1000                         | 83                  |
| AM1DS-0512SH30JZ ✖ | 5 (4.5-5.5)         | 12                   | 241 / 12                               | 84 / 9                         | 3000            | 560                          | 83                  |

|                    |                |     |          |          |      |      |    |
|--------------------|----------------|-----|----------|----------|------|------|----|
| AM1DS-0515SH30JZ ✘ | 5 (4.5-5.5)    | 15  | 241 / 18 | 67 / 7   | 3000 | 560  | 83 |
| AM1DS-0524SH30JZ ✘ | 5 (4.5-5.5)    | 24  | 241 / 18 | 42 / 4   | 3000 | 220  | 85 |
| AM1DS-1203SH30JZ   | 12 (10.8-13.2) | 3.3 | 112 / 8  | 303 / 30 | 3000 | 2400 | 75 |
| AM1DS-1205SH30JZ   | 12 (10.8-13.2) | 5   | 112 / 8  | 200 / 20 | 3000 | 2400 | 80 |
| AM1DS-1209SH30JZ   | 12 (10.8-13.2) | 9   | 112 / 8  | 111 / 12 | 3000 | 1000 | 80 |
| AM1DS-1212SH30JZ   | 12 (10.8-13.2) | 12  | 112 / 8  | 83 / 9   | 3000 | 560  | 80 |
| AM1DS-1215SH30JZ   | 12 (10.8-13.2) | 15  | 112 / 8  | 67 / 7   | 3000 | 560  | 81 |
| AM1DS-1224SH30JZ   | 12 (10.8-13.2) | 24  | 112 / 8  | 42 / 5   | 3000 | 220  | 81 |
| AM1DS-1505SH30JZ   | 15 (13.5-16.5) | 5   | 84 / 8   | 200 / 20 | 3000 | 2400 | 80 |
| AM1DS-1509SH30JZ   | 15 (13.5-16.5) | 9   | 84 / 8   | 111 / 12 | 3000 | 1000 | 80 |
| AM1DS-1512SH30JZ   | 15 (13.5-16.5) | 12  | 84 / 8   | 83 / 9   | 3000 | 560  | 80 |
| AM1DS-1515SH30JZ   | 15 (13.5-16.5) | 15  | 84 / 8   | 67 / 7   | 3000 | 560  | 81 |
| AM1DS-1524SH30JZ ✘ | 15 (13.5-16.5) | 24  | 84 / 8   | 42 / 5   | 3000 | 220  | 81 |
| AM1DS-2403SH30JZ   | 24 (21.6-26.4) | 3.3 | 56 / 8   | 303 / 30 | 3000 | 2400 | 75 |
| AM1DS-2405SH30JZ   | 24 (21.6-26.4) | 5   | 56 / 8   | 200 / 20 | 3000 | 2400 | 79 |
| AM1DS-2407SH30JZ ✘ | 24 (21.6-26.4) | 7.2 | 56 / 8   | 139 / 13 | 3000 | 1000 | 80 |
| AM1DS-2409SH30JZ   | 24 (21.6-26.4) | 9   | 56 / 8   | 111 / 12 | 3000 | 1000 | 80 |
| AM1DS-2412SH30JZ   | 24 (21.6-26.4) | 12  | 56 / 8   | 83 / 9   | 3000 | 560  | 81 |
| AM1DS-2415SH30JZ   | 24 (21.6-26.4) | 15  | 56 / 8   | 67 / 7   | 3000 | 560  | 81 |
| AM1DS-2424SH30JZ   | 24 (21.6-26.4) | 24  | 56 / 8   | 42 / 5   | 3000 | 220  | 81 |

\* Performance will be degraded if the load is not within the output current range.

## Dual Output

| Model           | Input Voltage (VDC) | Output Voltage (VDC) | Input Current Full   No load typ. (mA) | Output Current max   min (mA)* | Isolation (VDC) | Maximum capacitive Load (μF) | Efficiency Typ. (%) |
|-----------------|---------------------|----------------------|--|--------------------------------|-----------------|------------------------------|---------------------|
| AM1DS-0303DJZ ✘ | 3.3 (2.97-3.63)     | ±3.3                 | 384 / 10                               | ±152 / ±15                     | 1500            | ±1200                        | 78                  |
| AM1DS-0305DJZ ✘ | 3.3 (2.97-3.63)     | ±5                   | 370 / 18                               | ±100 / ±10                     | 1500            | ±1200                        | 82                  |
| AM1DS-0309DJZ ✘ | 3.3 (2.97-3.63)     | ±9                   | 370 / 18                               | ±56 / ±6                       | 1500            | ±470                         | 85                  |
| AM1DS-0312DJZ ✘ | 3.3 (2.97-3.63)     | ±12                  | 370 / 18                               | ±42 / ±5                       | 1500            | ±220                         | 82                  |
| AM1DS-0315DJZ ✘ | 3.3 (2.97-3.63)     | ±15                  | 370 / 18                               | ±34 / ±4                       | 1500            | ±220                         | 82                  |
| AM1DS-0324DJZ ✘ | 3.3 (2.97-3.63)     | ±24                  | 370 / 18                               | ±21 / ±2                       | 1500            | ±100                         | 84                  |
| AM1DS-0503DJZ ✘ | 5 (4.5-5.5)         | ±3.3                 | 270 / 5                                | ±152 / ±15                     | 1500            | ±1200                        | 74                  |
| AM1DS-0505DJZ   | 5 (4.5-5.5)         | ±5                   | 270 / 5                                | ±100 / ±10                     | 1500            | ±1200                        | 82                  |
| AM1DS-0509DJZ ✘ | 5 (4.5-5.5)         | ±9                   | 241 / 12                               | ±56 / ±6                       | 1500            | ±470                         | 83                  |
| AM1DS-0512DJZ ✘ | 5 (4.5-5.5)         | ±12                  | 241 / 12                               | ±42 / ±5                       | 1500            | ±220                         | 83                  |
| AM1DS-0515DJZ ✘ | 5 (4.5-5.5)         | ±15                  | 241 / 18                               | ±34 / ±4                       | 1500            | ±220                         | 83                  |
| AM1DS-0524DJZ ✘ | 5 (4.5-5.5)         | ±24                  | 241 / 18                               | ±21 / ±3                       | 1500            | ±100                         | 85                  |
| AM1DS-1203DJZ   | 12 (10.8-13.2)      | ±3.3                 | 105 / 8                                | ±152 / ±15                     | 1500            | ±1200                        | 75                  |
| AM1DS-1205DJZ   | 12 (10.8-13.2)      | ±5                   | 105 / 8                                | ±100 / ±10                     | 1500            | ±1200                        | 80                  |
| AM1DS-1209DJZ ✘ | 12 (10.8-13.2)      | ±9                   | 105 / 8                                | ±56 / ±5                       | 1500            | ±470                         | 80                  |
| AM1DS-1212DJZ   | 12 (10.8-13.2)      | ±12                  | 105 / 8                                | ±42 / ±5                       | 1500            | ±220                         | 81                  |
| AM1DS-1215DJZ   | 12 (10.8-13.2)      | ±15                  | 105 / 8                                | ±34 / ±4                       | 1500            | ±220                         | 81                  |
| AM1DS-1224DJZ   | 12 (10.8-13.2)      | ±24                  | 105 / 8                                | ±21 / ±3                       | 1500            | ±100                         | 80                  |
| AM1DS-1505DJZ   | 15 (13.5-16.5)      | ±5                   | 84 / 8                                 | ±100 / ±10                     | 1500            | ±1200                        | 80                  |
| AM1DS-1509DJZ ✘ | 15 (13.5-16.5)      | ±9                   | 84 / 8                                 | ±56 / ±5                       | 1500            | ±470                         | 80                  |
| AM1DS-1512DJZ   | 15 (13.5-16.5)      | ±12                  | 84 / 8                                 | ±42 / ±5                       | 1500            | ±220                         | 80                  |
| AM1DS-1515DJZ   | 15 (13.5-16.5)      | ±15                  | 84 / 8                                 | ±34 / ±4                       | 1500            | ±220                         | 81                  |

|                    |                 |      |          |            |      |       |    |
|--------------------|-----------------|------|----------|------------|------|-------|----|
| AM1DS-1524DJZ ✖    | 15 (13.5-16.5)  | ±24  | 84 / 8   | ±21 / ±2   | 1500 | ±100  | 81 |
| AM1DS-2405DJZ      | 24 (21.6-26.4)  | ±5   | 56 / 8   | ±100 / ±10 | 1500 | ±1200 | 80 |
| AM1DS-2409DJZ ✖    | 24 (21.6-26.4)  | ±9   | 56 / 8   | ±56 / ±5   | 1500 | ±470  | 80 |
| AM1DS-2412DJZ      | 24 (21.6-26.4)  | ±12  | 56 / 8   | ±42 / ±5   | 1500 | ±220  | 81 |
| AM1DS-2415DJZ      | 24 (21.6-26.4)  | ±15  | 56 / 8   | ±34 / ±4   | 1500 | ±220  | 79 |
| AM1DS-2424DJZ      | 24 (21.6-26.4)  | ±24  | 56 / 8   | ±21 / ±3   | 1500 | ±100  | 80 |
| AM1DS-0303DH30JZ ✖ | 3.3 (2.97-3.63) | ±3.3 | 384 / 10 | ±150 / ±15 | 3000 | ±1200 | 78 |
| AM1DS-0305DH30JZ ✖ | 3.3 (2.97-3.63) | ±5   | 370 / 18 | ±100 / ±10 | 3000 | ±1200 | 82 |
| AM1DS-0309DH30JZ ✖ | 3.3 (2.97-3.63) | ±9   | 370 / 18 | ±56 / ±6   | 3000 | ±470  | 85 |
| AM1DS-0312DH30JZ ✖ | 3.3 (2.97-3.63) | ±12  | 370 / 18 | ±42 / ±5   | 3000 | ±220  | 82 |
| AM1DS-0315DH30JZ ✖ | 3.3 (2.97-3.63) | ±15  | 370 / 18 | ±34 / ±4   | 3000 | ±220  | 82 |
| AM1DS-0324DH30JZ ✖ | 3.3 (2.97-3.63) | ±24  | 370 / 18 | ±21 / ±2   | 3000 | ±100  | 84 |
| AM1DS-0503DH30JZ ✖ | 5 (4.5-5.5)     | ±3.3 | 270 / 5  | ±152 / ±15 | 3000 | ±1200 | 74 |
| AM1DS-0505DH30JZ   | 5 (4.5-5.5)     | ±5   | 270 / 5  | ±100 / ±10 | 3000 | ±1200 | 82 |
| AM1DS-0509DH30JZ   | 5 (4.5-5.5)     | ±9   | 241 / 12 | ±56 / ±6   | 3000 | ±470  | 83 |
| AM1DS-0512DH30JZ   | 5 (4.5-5.5)     | ±12  | 241 / 12 | ±42 / ±5   | 3000 | ±220  | 83 |
| AM1DS-0515DH30JZ   | 5 (4.5-5.5)     | ±15  | 241 / 18 | ±34 / ±4   | 3000 | ±220  | 83 |
| AM1DS-0524DH30JZ   | 5 (4.5-5.5)     | ±24  | 241 / 18 | ±21 / ±3   | 3000 | ±100  | 85 |
| AM1DS-1203DH30JZ   | 12 (10.8-13.2)  | ±3.3 | 112 / 8  | ±152 / ±15 | 3000 | ±1200 | 75 |
| AM1DS-1205DH30JZ   | 12 (10.8-13.2)  | ±5   | 112 / 8  | ±100 / ±10 | 3000 | ±1200 | 80 |
| AM1DS-1209DH30JZ ✖ | 12 (10.8-13.2)  | ±9   | 112 / 8  | ±56 / ±5   | 3000 | ±470  | 80 |
| AM1DS-1212DH30JZ   | 12 (10.8-13.2)  | ±12  | 112 / 8  | ±42 / ±5   | 3000 | ±220  | 81 |
| AM1DS-1215DH30JZ   | 12 (10.8-13.2)  | ±15  | 112 / 8  | ±34 / ±4   | 3000 | ±220  | 81 |
| AM1DS-1224DH30JZ   | 12 (10.8-13.2)  | ±24  | 112 / 8  | ±21 / ±2   | 3000 | ±100  | 80 |
| AM1DS-1505DH30JZ   | 15 (13.5-16.5)  | ±5   | 84 / 8   | ±100 / ±10 | 3000 | ±1200 | 80 |
| AM1DS-1509DH30JZ ✖ | 15 (13.5-16.5)  | ±9   | 84 / 8   | ±56 / ±5   | 3000 | ±470  | 80 |
| AM1DS-1512DH30JZ   | 15 (13.5-16.5)  | ±12  | 84 / 8   | ±42 / ±5   | 3000 | ±220  | 80 |
| AM1DS-1515DH30JZ   | 15 (13.5-16.5)  | ±15  | 84 / 8   | ±34 / ±4   | 3000 | ±220  | 81 |
| AM1DS-1524DH30JZ ✖ | 15 (13.5-16.5)  | ±24  | 84 / 8   | ±21 / ±2   | 3000 | ±100  | 81 |
| AM1DS-2403DH30JZ ✖ | 24 (21.6-26.4)  | ±3.3 | 56 / 8   | ±150 / ±15 | 3000 | ±1200 | 76 |
| AM1DS-2405DH30JZ   | 24 (21.6-26.4)  | ±5   | 56 / 8   | ±100 / ±10 | 3000 | ±1200 | 80 |
| AM1DS-2409DH30JZ ✖ | 24 (21.6-26.4)  | ±9   | 56 / 8   | ±56 / ±5   | 3000 | ±470  | 80 |
| AM1DS-2412DH30JZ   | 24 (21.6-26.4)  | ±12  | 56 / 8   | ±42 / ±5   | 3000 | ±220  | 81 |
| AM1DS-2415DH30JZ   | 24 (21.6-26.4)  | ±15  | 56 / 8   | ±34 / ±4   | 3000 | ±220  | 79 |
| AM1DS-2424DH30JZ   | 24 (21.6-26.4)  | ±24  | 56 / 8   | ±21 / ±2   | 3000 | ±100  | 80 |

\* Performance will be degraded if the load is not within the output current range.

| Input Specification            |                             |         |         |       |
|--------------------------------|-----------------------------|---------|---------|-------|
| Parameters                     | Conditions                  | Typical | Maximum | Units |
| Filter                         | Capacitor                   |         |         |       |
| Absolute maximum rating        | Maximum duration 1s, 3.3Vin | > -0.7  | 5       | VDC   |
|                                | Maximum duration 1s, 5Vin   | > -0.7  | 9       | VDC   |
|                                | Maximum duration 1s, 12Vin  | > -0.7  | 18      | VDC   |
|                                | Maximum duration 1s, 15Vin  | > -0.7  | 21      | VDC   |
|                                | Maximum duration 1s, 24Vin  | > -0.7  | 30      | VDC   |
| Input reflected ripple current |                             | 15      |         | mA    |

| Isolation Specification |   |         |         |            |
|-------------------------|---|---------|---------|------------|
| Parameters              | Conditions                                | Typical | Maximum | Units      |
| Tested I/O voltage      | 60 sec, leakage $\leq$ 1mA                | >1500   |         | VDC        |
|                         | 60 sec, leakage $\leq$ 1mA for H30 models | >3000   |         | VDC        |
| Resistance              | 500VDC                                    | >1000   |         | M $\Omega$ |
| Capacitance             | 100kHz/0.1V                               | 20      |         | pF         |

| Output Specification    |   |            |           |                 |
|-------------------------|---|------------|-----------|-----------------|
| Parameters              | Conditions                                      | Typical    | Maximum   | Units           |
| Voltage accuracy        | See output voltage tolerance                    | 10         | 14        | %               |
| Line regulation         | Per 1% Vin change, 3.3Vout models               |            | $\pm$ 1.5 | %               |
|                         | Per 1% Vin change, other models                 |            | $\pm$ 1.2 | %               |
| Load regulation         | 10-100% load, other 3.3Vout models              |            | 20        | %               |
|                         | 10-100% load, 3.3Vin, 3.3Vout models            |            | 18        | %               |
|                         | 10-100% load, other 5Vout & 3.3Vin other models |            | 15        | %               |
|                         | 10-100% load, other models                      |            | 10        | %               |
| Ripple & Noise*         | 24Vout models                                   | 50         | 100       | mV pk-pk        |
|                         | other models                                    | 30         | 75        | mV pk-pk        |
| Temperature coefficient | Full load                                       | $\pm$ 0.02 |           | %/ $^{\circ}$ C |

\* Ripple and Noise are measured at 20MHz bandwidth. Please refer to the application note for specific details.

| General Specifications       |   |             |         |              |
|------------------------------|---|-------------|---------|--------------|
| Parameters                   | Conditions  | Typical     | Maximum | Units        |
| Switching frequency          | Full load, nominal input, 3.3Vin models                                       | 220         |         | KHz          |
|                              | Full load, nominal input, 5Vin models   | 270         |         | KHz          |
|                              | Full load, nominal input, other models  | 260         |         | KHz          |
| Short circuit protection     | Continuous, Auto recovery   |             |         |              |
| Operating temperature        | With derating   | -40 to +105 |         | $^{\circ}$ C |
| Storage temperature          |   | -55 to +125 |         | $^{\circ}$ C |
| Case temperature rise        | Ambient temperature at 25 $^{\circ}$ C, 3.3Vin & 5Vin, 3.3Vout & other models | 25          |         | $^{\circ}$ C |
|                              | Ambient temperature at 25 $^{\circ}$ C, 3.3Vin & 5Vin, other models           | 15          |         | $^{\circ}$ C |
| Manual soldering temperature | 1.5mm away from case, duration $\leq$ 10sec                                   |             | 300     | $^{\circ}$ C |
| Cooling                      | Free air convection   |             |         |              |
| Humidity                     | Non-condensing  | >5          | 95      | % RH         |
| Vibration                    | 10-150Hz, 5G, 30Min, along all axis, 12/15/24Vin models only                  |             |         |              |
| Case material                | Black plastic (flammability to UL 94V-0)                                      |             |         |              |
| Weight                       |   | 2.1         |         | g            |
| Dimensions (L x W x H)       | 0.77 x 0.24 x 0.40 inches (19.65 x 6.00 x 10.16 mm)                           |             |         |              |
| MTBF                         | 3 500 000 hrs (MIL-HDBK -217F, t=+25 $^{\circ}$ C) / Full Load                |             |         |              |

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25 $^{\circ}$ C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

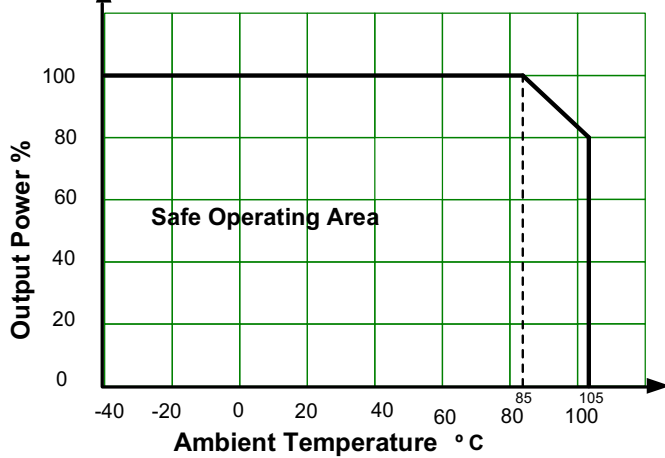
| Safety Specifications |   |   |
|-----------------------|---|---|
| Parameters            |   |   |
| Agency approvals      | UL 62368-1 (With exception of models marked with ✖) |   |
| Standards             | Information technology Equipment                    | Design to meet IEC/EN/UL62368-1   |
|                       | EMC - Conducted and radiated emission               | CISPR32 / EN55032, class B with the recommended EMI circuit   |
|                       | Electrostatic Discharge Immunity                    | IEC 61000-4-2 Air $\pm 8$ KV, Contact $\pm 4$ KV, Criteria B for 5Vin models<br>IEC 61000-4-2 Air $\pm 8$ KV, Contact $\pm 6$ KV, Criteria B for 3.3/12/15/24Vin models |

## Derating



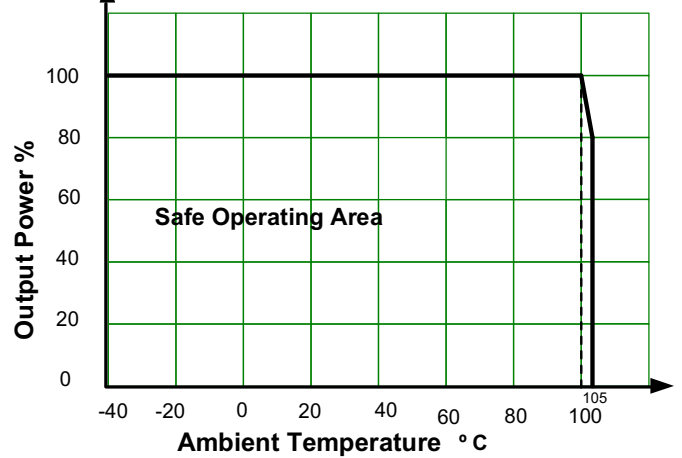
### 5Vin models

Free Air Convection



### 3.3/12/15/24Vin models

Free Air Convection

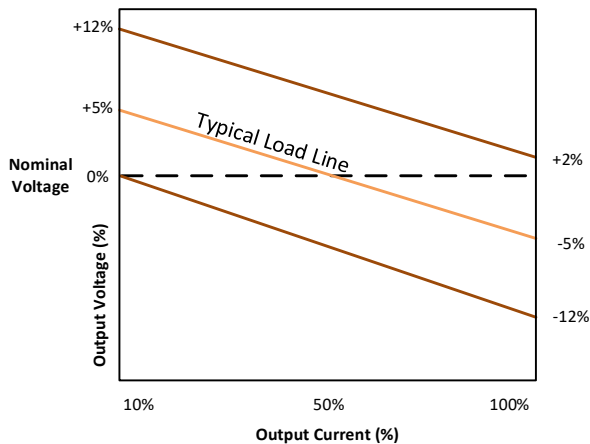


## Output voltage tolerance



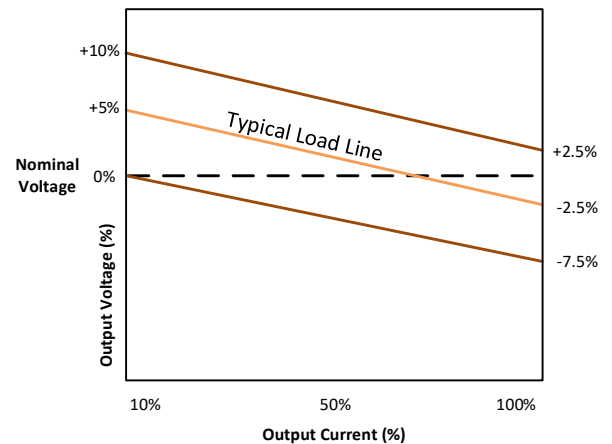
### All 3.3Vout models

Tolerance Envelope Graph

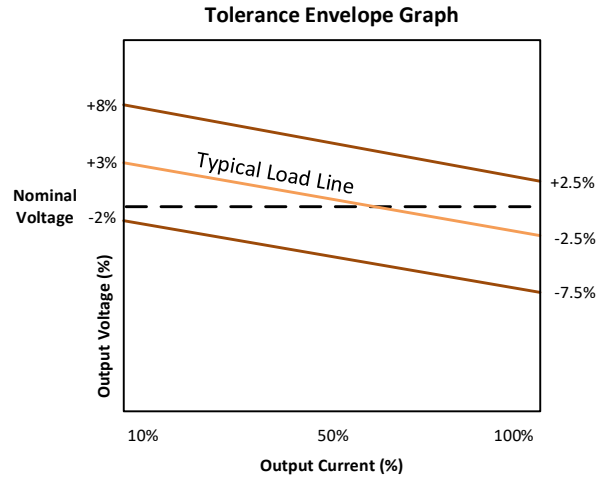


### 3.3/5Vin, 5/9/12/15/24Vout models

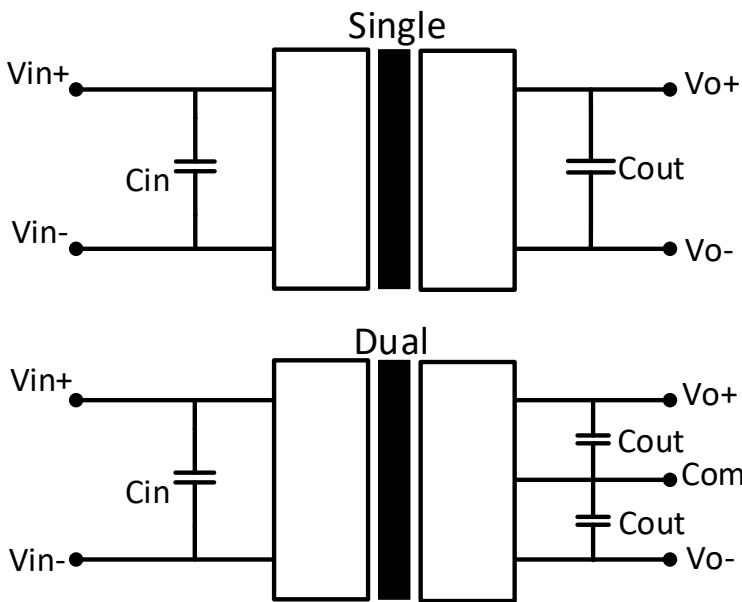
Tolerance Envelope Graph



## Other models



## Typical application circuit

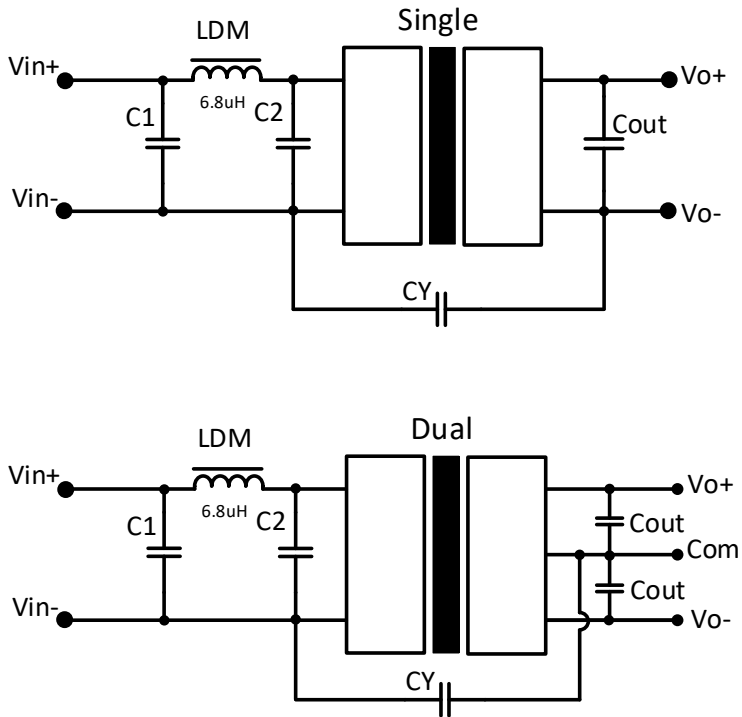


| Vin    | Cin             |
|--------|-----------------|
| 3.3V   | 10 $\mu$ F/16V  |
| 5V     | 4.7 $\mu$ F     |
| 12/15V | 2.2 $\mu$ F/25V |
| 24V    | 1 $\mu$ F/50V   |

| 3.3Vin single output models |                 | 3.3Vin dual output models |                 |
|-----------------------------|-----------------|---------------------------|-----------------|
| Vout                        | Cout            | Vout                      | Cout            |
| 3.3/5V                      | 10 $\mu$ F/16V  | $\pm$ 3.3/ $\pm$ 5V       | 10 $\mu$ F/16V  |
| 9/12V                       | 2.2 $\mu$ F/25V | $\pm$ 9/ $\pm$ 12V        | 2.2 $\mu$ F/25V |
| 15/24V                      | 1 $\mu$ F/50V   | $\pm$ 15/ $\pm$ 24V       | 1 $\mu$ F/50V   |

| Other single output models |                 | Other dual output models |                  |
|----------------------------|-----------------|--------------------------|------------------|
| Vout                       | Cout            | Vout                     | Cout             |
| 3.3/5V                     | 10 $\mu$ F/16V  | $\pm$ 3.3/ $\pm$ 5V      | 4.7 $\mu$ F/16V  |
| 7.2/9V                     | 2.2 $\mu$ F/16V | $\pm$ 9V                 | 1 $\mu$ F/16V    |
| 12V                        | 2.2 $\mu$ F/25V | $\pm$ 12V                | 1 $\mu$ F/25V    |
| 15V                        | 1 $\mu$ F/25V   | $\pm$ 15V                | 0.47 $\mu$ F/25V |
| 24V                        | 1 $\mu$ F/50V   | $\pm$ 24V                | 0.47 $\mu$ F/50V |

## Recommended EMI circuit



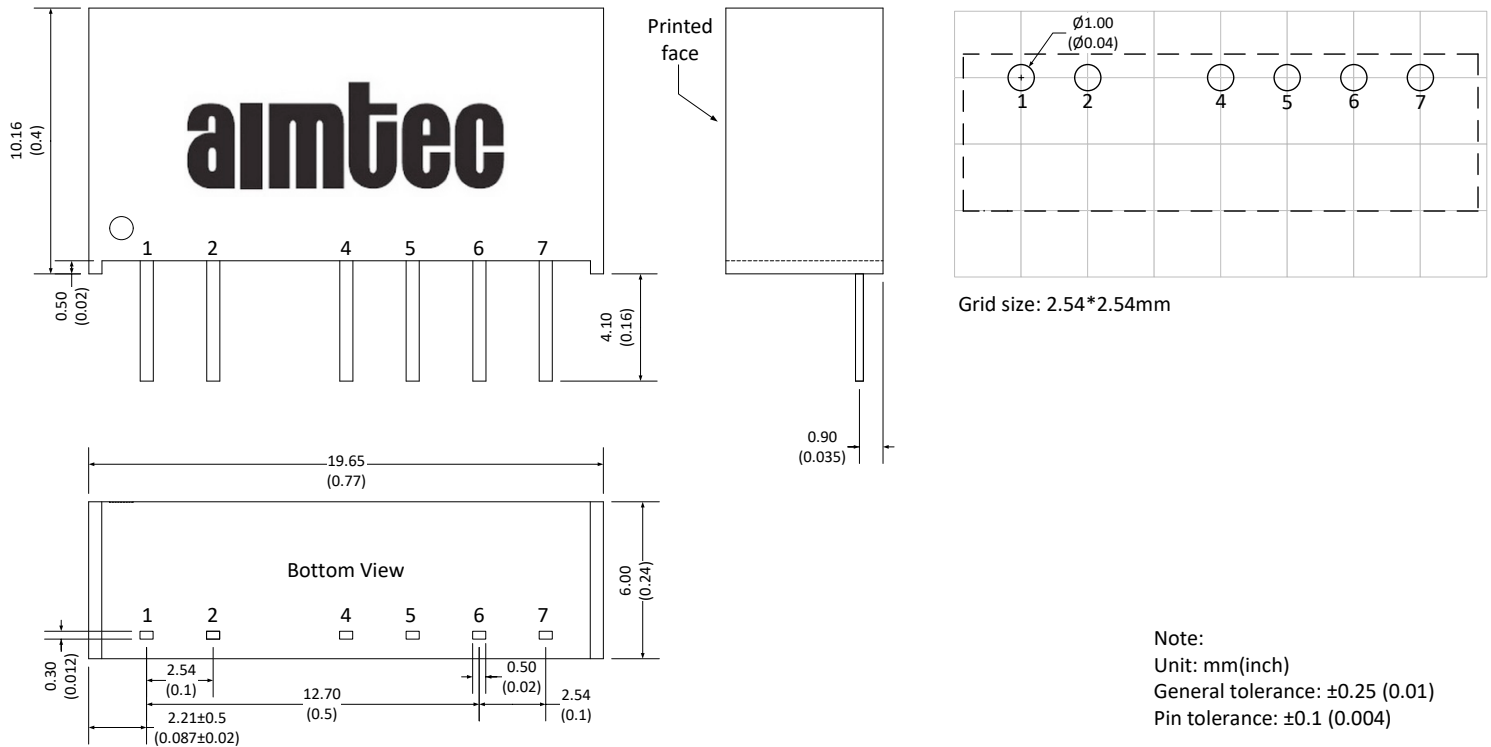
| 3.3Vin models |           |             |
|---------------|-----------|-------------|
| Vout          | C1/C2     | CY          |
| 3.3/5V        | 4.7μF/16V | -           |
| 9/12/15/24V   | 4.7μF/16V | 270pF/4kVdc |

| 5Vin models |           |           |
|-------------|-----------|-----------|
| Vout        | C1/C2     | CY        |
| 3.3/5/9V    | 4.7μF/25V | -         |
| 12/15/24V   | 4.7μF/25V | 1nF/4kVdc |

| 12/15/24Vin models |           |             |
|--------------------|-----------|-------------|
| Isolation          | C1/C2     | CY          |
| 1.5KV              | 4.7μF/50V | 270pF/2kVdc |
| 3KV                | 4.7μF/50V | 270pF/3kVdc |



## Dimensions



Pin Out Specifications

| Pin | 1.5KV isolation Single output | 1.5KV isolation Dual output | 3KV isolation Single output | 3KV isolation Dual output |
|-----|-------------------------------|-----------------------------|-----------------------------|---------------------------|
| 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                        | Com                         | -V Output                   | -V Output                 |
| 6   | +V Output                     | +V Output                   | No pin                      | Com                       |
| 7   | No pin                        | No pin                      | +V Output                   | +V Output                 |

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