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AM1PS-JZ



The AM1PS-JZ is a 1W DIP8 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 DIP8 design will surely benefit your new system design.

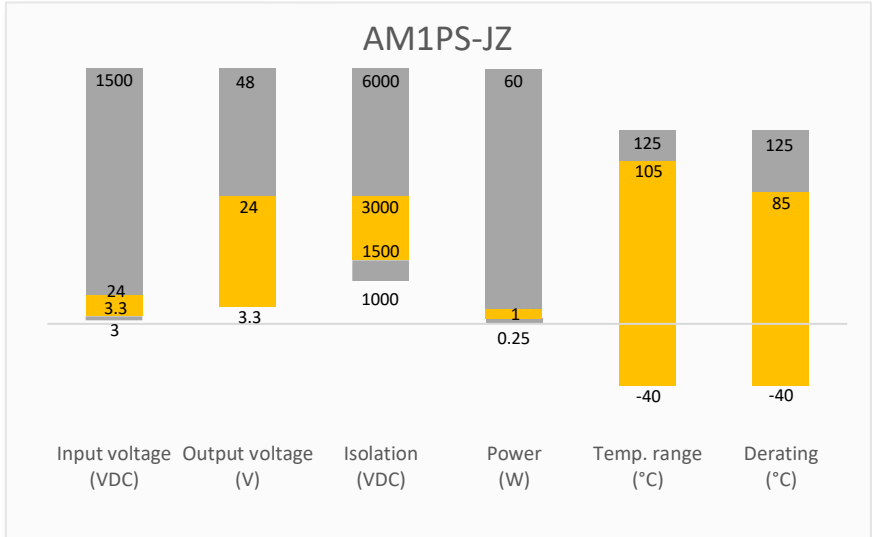
This new series offers great operating temperatures, from -40 to 105°C with full power up to 85°C. Also, an isolation of 1500 or 3000VDC for improved reliability and system safety as well as a great 3,500,000h MTBF come standard.

The AM1PS-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 DIP8 pin-out
- Efficiency up to 85%
- Unregulated output

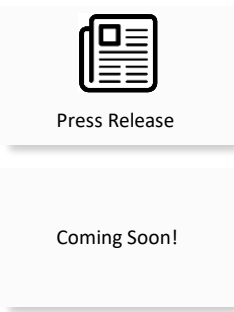
Summary



Training



Product Training Video
(click to open)



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. (%) |
| AM1PS-0303SJZ ✖ | 3.3 (2.97-3.63) | 3.3 | 384 / 12 | 303 / 30 | 1500 | 2400 | 79 |
| AM1PS-0305SJZ ✖ | 3.3 (2.97-3.63) | 5 | 370 / 12 | 200 / 20 | 1500 | 2400 | 82 |
| AM1PS-0503SJZ ✖ | 5 (4.5-5.5) | 3.3 | 270 / 5 | 303 / 30 | 1500 | 2400 | 74 |
| AM1PS-0505SJZ ✖ | 5 (4.5-5.5) | 5 | 270 / 5 | 200 / 20 | 1500 | 2400 | 82 |
| AM1PS-0507SJZ ✖ | 5 (4.5-5.5) | 7.2 | 241 / 12 | 139 / 13 | 1500 | 1000 | 80 |
| AM1PS-0509SJZ ✖ | 5 (4.5-5.5) | 9 | 241 / 12 | 111 / 12 | 1500 | 1000 | 83 |
| AM1PS-0512SJZ ✖ | 5 (4.5-5.5) | 12 | 241 / 12 | 84 / 9 | 1500 | 560 | 83 |
| AM1PS-0515SJZ ✖ | 5 (4.5-5.5) | 15 | 241 / 18 | 67 / 7 | 1500 | 560 | 83 |
| AM1PS-0524SJZ ✖ | 5 (4.5-5.5) | 24 | 241 / 18 | 42 / 4 | 1500 | 220 | 85 |
| AM1PS-1203SJZ | 12 (10.8-13.2) | 3.3 | 112 / 8 | 303 / 30 | 1500 | 2400 | 75 |
| AM1PS-1205SJZ | 12 (10.8-13.2) | 5 | 105 / 8 | 200 / 20 | 1500 | 2400 | 80 |
| AM1PS-1209SJZ ✖ | 12 (10.8-13.2) | 9 | 105 / 8 | 111 / 12 | 1500 | 1200 | 78 |
| AM1PS-1212SJZ | 12 (10.8-13.2) | 12 | 105 / 8 | 83 / 9 | 1500 | 560 | 80 |
| AM1PS-1215SJZ | 12 (10.8-13.2) | 15 | 103 / 8 | 67 / 7 | 1500 | 560 | 81 |
| AM1PS-1224SJZ | 12 (10.8-13.2) | 24 | 103 / 8 | 42 / 5 | 1500 | 220 | 81 |
| AM1PS-1505SJZ ✖ | 15 (13.5-16.5) | 5 | 83 / 8 | 200 / 20 | 1500 | 2400 | 80 |
| AM1PS-1509SJZ ✖ | 15 (13.5-16.5) | 9 | 82 / 8 | 111 / 12 | 1500 | 1200 | 80 |
| AM1PS-1515SJZ ✖ | 15 (13.5-16.5) | 15 | 82 / 8 | 67 / 7 | 1500 | 560 | 81 |
| AM1PS-2403SJZ | 24 (21.6-26.4) | 3.3 | 56 / 8 | 303 / 30 | 1500 | 2400 | 75 |
| AM1PS-2405SJZ | 24 (21.6-26.4) | 5 | 53 / 8 | 200 / 20 | 1500 | 2400 | 79 |
| AM1PS-2409SJZ ✖ | 24 (21.6-26.4) | 9 | 52 / 8 | 111 / 12 | 1500 | 1200 | 80 |
| AM1PS-2412SJZ | 24 (21.6-26.4) | 12 | 52 / 8 | 83 / 9 | 1500 | 560 | 81 |
| AM1PS-2415SJZ | 24 (21.6-26.4) | 15 | 52 / 8 | 67 / 7 | 1500 | 560 | 81 |
| AM1PS-2424SJZ | 24 (21.6-26.4) | 24 | 52 / 8 | 42 / 5 | 1500 | 220 | 81 |
| AM1PS-0503SH30JZ | 5 (4.5-5.5) | 3.3 | 270 / 5 | 303 / 30 | 3000 | 2400 | 74 |
| AM1PS-0505SH30JZ | 5 (4.5-5.5) | 5 | 270 / 5 | 200 / 20 | 3000 | 2400 | 82 |
| AM1PS-0507SH30JZ ✖ | 5 (4.5-5.5) | 7.2 | 241 / 12 | 139 / 13 | 3000 | 1000 | 80 |
| AM1PS-0509SH30JZ | 5 (4.5-5.5) | 9 | 241 / 12 | 111 / 12 | 3000 | 1000 | 83 |
| AM1PS-0512SH30JZ | 5 (4.5-5.5) | 12 | 241 / 12 | 84 / 9 | 3000 | 560 | 83 |
| AM1PS-0515SH30JZ | 5 (4.5-5.5) | 15 | 241 / 18 | 67 / 7 | 3000 | 560 | 83 |
| AM1PS-0524SH30JZ | 5 (4.5-5.5) | 24 | 241 / 18 | 42 / 4 | 3000 | 220 | 85 |
| AM1PS-1203SH30JZ | 12 (10.8-13.2) | 3.3 | 112 / 8 | 303 / 30 | 3000 | 2400 | 75 |
| AM1PS-1205SH30JZ | 12 (10.8-13.2) | 5 | 105 / 8 | 200 / 20 | 3000 | 2400 | 80 |
| AM1PS-1209SH30JZ ✖ | 12 (10.8-13.2) | 9 | 105 / 8 | 111 / 12 | 3000 | 1200 | 78 |
| AM1PS-1212SH30JZ | 12 (10.8-13.2) | 12 | 105 / 8 | 83 / 9 | 3000 | 560 | 80 |
| AM1PS-1215SH30JZ | 12 (10.8-13.2) | 15 | 103 / 8 | 67 / 7 | 3000 | 560 | 81 |
| AM1PS-1224SH30JZ | 12 (10.8-13.2) | 24 | 103 / 8 | 42 / 5 | 3000 | 220 | 81 |
| AM1PS-1505SH30JZ ✖ | 15 (13.5-16.5) | 5 | 83 / 8 | 200 / 20 | 3000 | 2400 | 80 |
| AM1PS-1509SH30JZ ✖ | 15 (13.5-16.5) | 9 | 82 / 8 | 111 / 12 | 3000 | 1200 | 80 |
| AM1PS-1515SH30JZ ✖ | 15 (13.5-16.5) | 15 | 82 / 8 | 67 / 7 | 3000 | 560 | 81 |
| AM1PS-2403SH30JZ | 24 (21.6-26.4) | 3.3 | 56 / 8 | 303 / 30 | 3000 | 2400 | 75 |
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| | | | | | | | |
|--------------------|----------------|----|--------|----------|------|------|----|
| AM1PS-2409SH30JZ ✖ | 24 (21.6-26.4) | 9 | 52 / 8 | 111 / 12 | 3000 | 1200 | 80 |
| AM1PS-2412SH30JZ | 24 (21.6-26.4) | 12 | 52 / 8 | 83 / 9 | 3000 | 560 | 81 |
| AM1PS-2415SH30JZ | 24 (21.6-26.4) | 15 | 52 / 8 | 67 / 7 | 3000 | 560 | 81 |
| AM1PS-2424SH30JZ | 24 (21.6-26.4) | 24 | 52 / 8 | 42 / 5 | 3000 | 220 | 81 |

* 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 | 3.3Vin models | 30 | | mA |
| | Other models | 15 | | mA |

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

| Output Specification | | | | |
|-------------------------|-----------------------------------|---------|---------|----------|
| Parameters | Conditions | Typical | Maximum | Units |
| Voltage accuracy | See output voltage tolerance | 10 | 16 | % |
| Line regulation | Per 1% Vin change, 3.3Vout models | | 1.5 | % |
| | Per 1% Vin change, other models | | 1.2 | % |
| Load regulation | 10-100% load, 3.3Vout models | | 20 | % |
| | 10-100% load, 5/7.2Vout models | | 15 | % |
| | 10-100% load, other models | | 10 | % |
| Ripple & Noise* | 24Vout and 3.3Vin models | 50 | 100 | mV pk-pk |
| | other models | 30 | 75 | mV pk-pk |
| Temperature coefficient | | ±0.02 | | %/°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, 1.5KV isolation models | 300 | | KHz |
| | Full load, nominal input, 5Vin, 3KV isolation models | 270 | | KHz |
| | Full load, nominal input, other models | 260 | | KHz |
| Short circuit protection | Continuous, Auto recovery | | | |
| Operating temperature | With derating | -40 to +105 | | °C |
| Storage temperature | | -55 to +125 | | °C |

| | | | | |
|------------------------------|---|-----|-----|------|
| Case temperature rise | Ta = 25°C, 5Vin, 5/7.2/9/12/15/24Vout models | 15 | | °C |
| | Ta = 25°C, other models | 25 | | °C |
| Manual soldering temperature | 1.5mm away from case, duration ≤ 10sec, 3.3/5Vin models | | 300 | °C |
| | 1.5mm away from case, duration ≤ 10sec, other models | | 260 | °C |
| Cooling | Free air convection | | | |
| Humidity | Non-condensing | >5 | 95 | % RH |
| Vibration | 10-150Hz, 5G, 0.75mm, along all axis | | | |
| Case material | Black plastic (flammability to UL 94V-0) | | | |
| Weight | | 1.8 | | g |
| Dimensions (L x W x H) | 0.50 x 0.40 x 0.32 inches (12.70 x 10.16 x 8.20 mm) | | | |
| MTBF | 3 500 000 hrs (MIL-HDBK -217F, t=+25°C) / Full Load | | | |

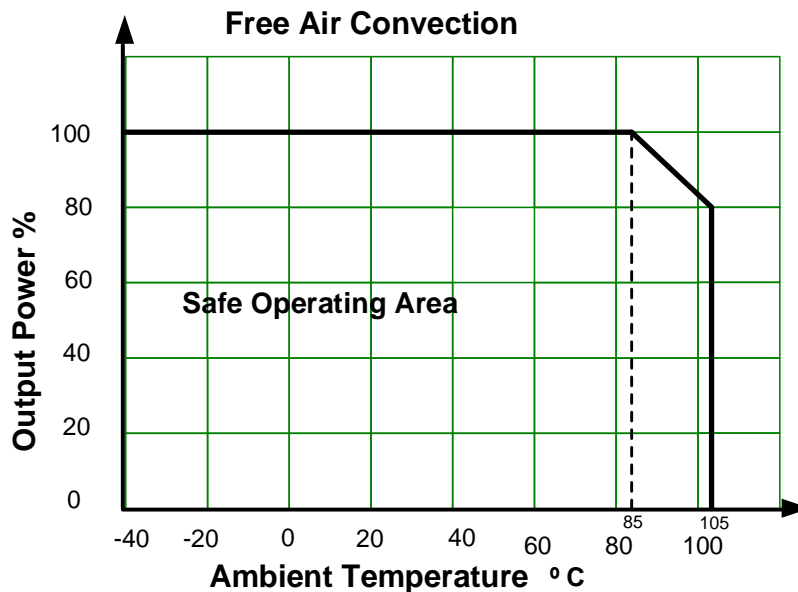
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Safety Specifications

Parameters

| | | |
|-----------------|--|--|
| Agency approval | cULus UL62368-1 (With exception of models marked with ✖) | |
| Standards | Information technology equipment | Design to meet IEC/EN62368-1 |
| | EMC - Conducted and radiated emission | CISPR32 / EN55032, class B with the recommended EMI circuit |
| | Electrostatic Discharge Immunity | IEC 61000-4-2 Air ±8KV, Contact ±4KV, Criteria B for 5Vin, 3KV isolation models IEC 61000-4-2 Air ±8KV, Contact ±6KV, Criteria B for other models |

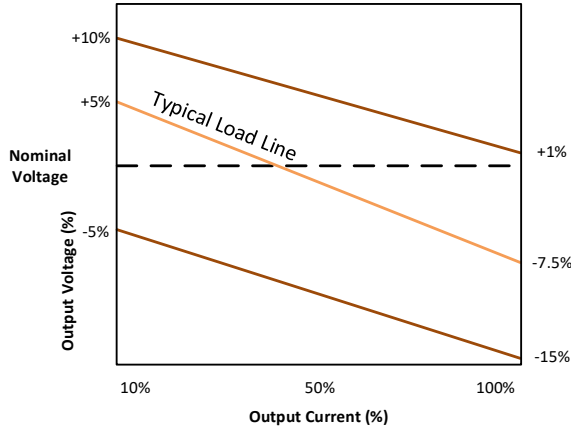
Derating



Output voltage tolerance

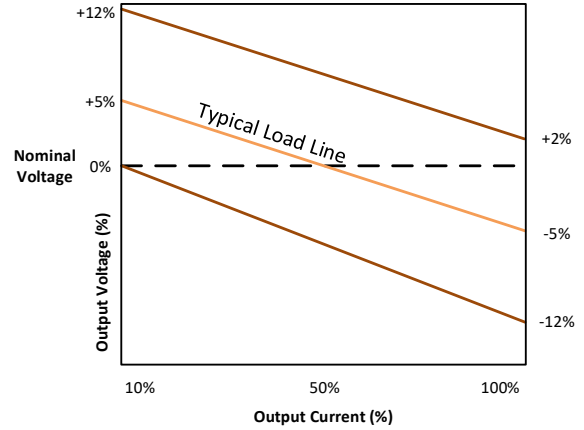
AM1PS-0303SJZ

Tolerance Envelope Graph



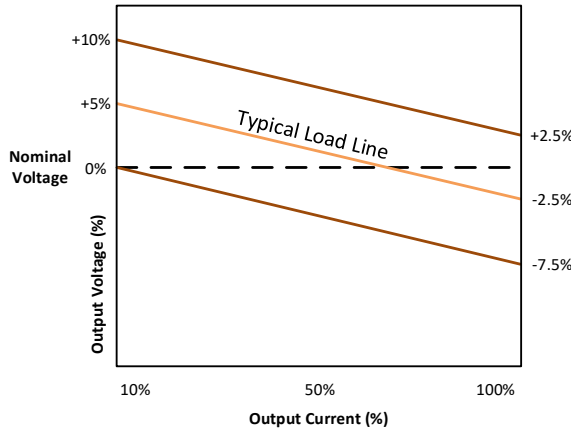
5/12/15/24Vin, 3.3Vout models

Tolerance Envelope Graph



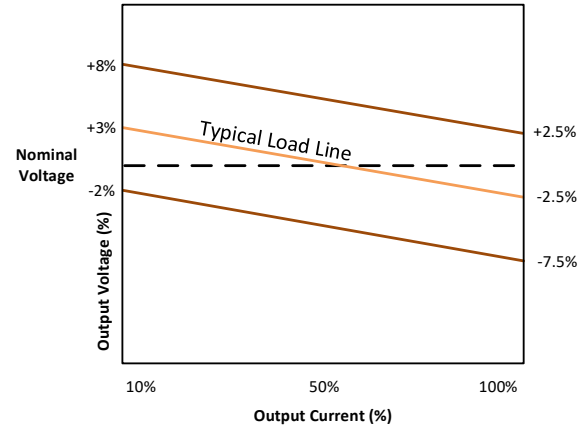
AM1PS-0305SJZ and 5Vin, other models

Tolerance Envelope Graph

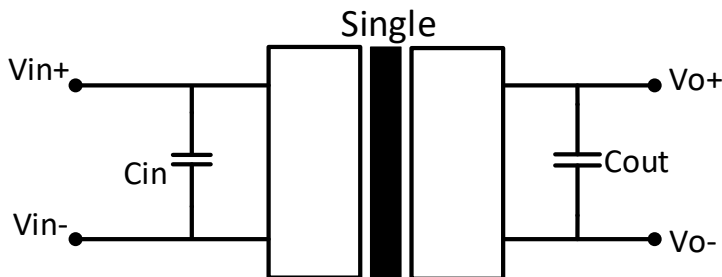


12/15/24Vin, other models

Tolerance Envelope Graph



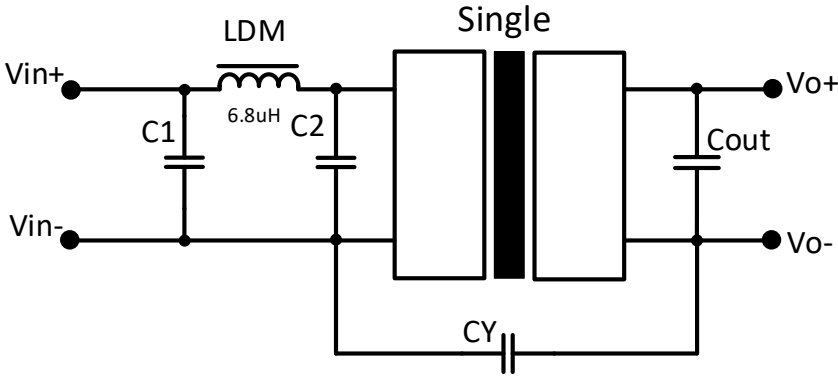
Typical application circuit



| Vin | Cin |
|--------|-------------|
| 3.3V | 10 μ F |
| 5V | 4.7 μ F |
| 12/15V | 2.2 μ F |
| 24V | 1 μ F |

| Vout | Cout |
|-------------------------|-------------|
| 3.3/5/7.2V | 10 μ F |
| 9V (5Vin series) | 2.2 μ F |
| 9V (12/15/24Vin series) | 4.7 μ F |
| 12V | 2.2 μ F |
| 15/24V | 1 μ F |

Recommended EMI circuit



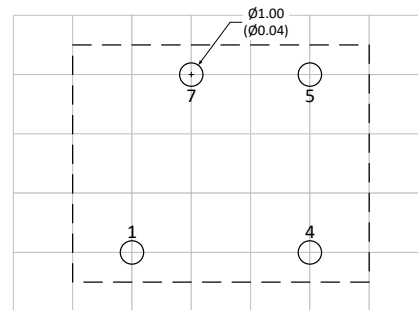
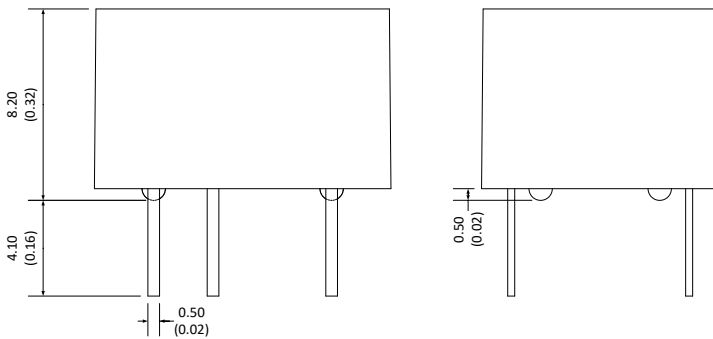
| 3.3Vin models | | |
|---------------|-----------|-------------|
| Vout | C1/C2 | CY |
| All | 4.7μF/16V | 270pF/2kVdc |

| 5Vin, 1.5KV isolation models | | |
|------------------------------|-----------|-------------|
| Vout | C1/C2 | CY |
| 3.3/5/7.2/9V | 4.7μF/25V | 100pF/2kVdc |
| 12/15/24V | 4.7μF/25V | 1nF/2kVdc |

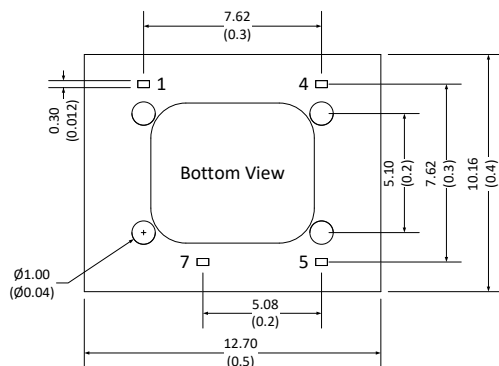
| 5Vin, 3KV isolation models | | |
|----------------------------|-----------|-----------|
| Vout | C1/C2 | CY |
| 3.3/5/7.2/9V | 4.7μF/25V | - |
| 12/15/24V | 4.7μF/25V | 1nF/4kVdc |

| 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 | Single output |
| 1 | -V Input |
| 4 | +V Input |
| 5 | +V Output |
| 7 | -V Output |



Grid size: 2.54*2.54mm

Note:
Unit: mm(inch)
General tolerance: ±0.25 (0.01)
Pin tolerance: ±0.1 (0.004)

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 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 than the ones listed in this datasheet. 7. Warranty is in accordance with Aimtec's standard Terms of Sale available at www.aimtec.com.