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AM6TW-NZ



DIL

Aimtec adds the AM6TW-NZ 6W series to its 24PIN DIL Package DC/DC converters family. With the 6W new single/dual output series, Aimtec provides better coverage of the DIL package product up to 6W.

The AM6TW-NZ series provide a wide 4:1 input voltage range and comes standard with single regulated output voltages of 3.3, 5, 9, 12, 15 and 24VDC with I/O isolation of 1500VDC/3000/6000VDC.

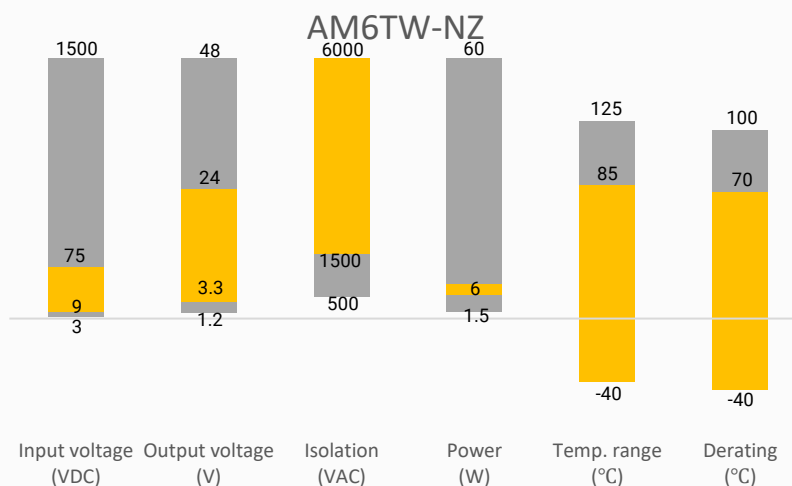
Thanks to its wide -40°C to +85°C operating temperature range, the AM6TW-NZ is suitable for applications such as industrial control, grid power, instrumentation, and telecommunication. In addition, there are protections for input under-voltage, output short circuit, over-voltage and over-current are also included, increasing the overall safety of your new system design.

Features

- Wide 4:1 Input Range: 9-36VDC & 18-75VDC
- Operating Temp: -40 °C to +85 °C
- Low ripple & noise, up to 100mV(p-p) typ.
- Efficiency up to 88%
- Output short circuit, over current protection, over-voltage protection, Input under-voltage protection
- Regulated Output



Summary



Training



Product Training Video
(click to open)



Press Release

Coming Soon!

Application Notes

Applications



Power Grid



Industrial



Telecom



Instrumentation

Models & Specifications

Single Output

| Model | Input Voltage (VDC) | Output Voltage (VDC) | Input Current Max (mA) | | Output Current Max (mA) | Maximum Capacitive Load (μF) | Efficiency (%) Full Load (Typ.) |
|-------------------|---------------------|----------------------|------------------------|-----------|-------------------------|------------------------------|---------------------------------|
| | | | No Load | Full Load | | | |
| AM6TW-2403S-NZ | 24 (9 ~ 36) | 3.3 | 5 | 268 | 1500 | 1800 | 77 |
| AM6TW-2405S-NZ | 24 (9 ~ 36) | 5 | 5 | 305 | 1200 | 1000 | 82 |
| AM6TW-2412S-NZ | 24 (9 ~ 36) | 12 | 5 | 294 | 500 | 470 | 85 |
| AM6TW-2415S-NZ | 24 (9 ~ 36) | 15 | 5 | 291 | 400 | 220 | 86 |
| AM6TW-2424S-NZ | 24 (9 ~ 36) | 24 | 5 | 291 | 250 | 100 | 86 |
| AM6TW-4803S-NZ | 48 (18 ~ 75) | 3.3 | 5 | 131 | 1500 | 1800 | 79 |
| AM6TW-4805S-NZ | 48 (18 ~ 75) | 5 | 5 | 150 | 1200 | 1000 | 82 |
| AM6TW-4812S-NZ | 48 (18 ~ 75) | 12 | 5 | 144 | 500 | 470 | 87 |
| AM6TW-4815S-NZ | 48 (18 ~ 75) | 15 | 5 | 142 | 400 | 220 | 88 |
| AM6TW-4824S-NZ | 48 (18 ~ 75) | 24 | 5 | 144 | 250 | 100 | 87 |
| AM6TW-2403SH30-NZ | 24 (9 ~ 36) | 3.3 | 5 | 268 | 1500 | 1800 | 77 |
| AM6TW-2405SH30-NZ | 24 (9 ~ 36) | 5 | 5 | 305 | 1200 | 1000 | 82 |
| AM6TW-2409SH30-NZ | 24 (9 ~ 36) | 9 | 5 | 298 | 667 | 680 | 84 |
| AM6TW-2412SH30-NZ | 24 (9 ~ 36) | 12 | 5 | 294 | 500 | 470 | 85 |
| AM6TW-2415SH30-NZ | 24 (9 ~ 36) | 15 | 5 | 291 | 400 | 220 | 86 |
| AM6TW-2424SH30-NZ | 24 (9 ~ 36) | 24 | 5 | 291 | 250 | 100 | 86 |
| AM6TW-4803SH30-NZ | 48 (18 ~ 75) | 3.3 | 5 | 131 | 1500 | 1800 | 79 |
| AM6TW-4805SH30-NZ | 48 (18 ~ 75) | 5 | 5 | 150 | 1200 | 1000 | 82 |
| AM6TW-4812SH30-NZ | 48 (18 ~ 75) | 12 | 5 | 144 | 500 | 470 | 87 |
| AM6TW-4815SH30-NZ | 48 (18 ~ 75) | 15 | 5 | 142 | 400 | 220 | 88 |
| AM6TW-4824SH30-NZ | 48 (18 ~ 75) | 24 | 5 | 144 | 250 | 100 | 87 |
| AM6TW-2405SH60-NZ | 24 (9 ~ 36) | 5 | 5 | 309 | 1200 | 2700 | 81 |
| AM6TW-2406SH60-NZ | 24 (9 ~ 36) | 6 | 5 | 305 | 1000 | 2200 | 82 |
| AM6TW-2409SH60-NZ | 24 (9 ~ 36) | 9 | 5 | 301 | 667 | 1800 | 83 |
| AM6TW-2412SH60-NZ | 24 (9 ~ 36) | 12 | 5 | 298 | 500 | 1000 | 84 |
| AM6TW-2424SH60-NZ | 24 (9 ~ 36) | 24 | 5 | 298 | 250 | 470 | 84 |
| AM6TW-4805SH60-NZ | 48 (18 ~ 75) | 5 | 5 | 152 | 1200 | 2700 | 82 |
| AM6TW-4809SH60-NZ | 48 (18 ~ 75) | 9 | 5 | 151 | 667 | 1800 | 83 |
| AM6TW-4812SH60-NZ | 48 (18 ~ 75) | 12 | 5 | 149 | 500 | 1000 | 84 |
| AM6TW-4815SH60-NZ | 48 (18 ~ 75) | 15 | 5 | 147 | 400 | 680 | 85 |
| AM6TW-4824SH60-NZ | 48 (18 ~ 75) | 24 | 5 | 149 | 250 | 470 | 84 |

Dual Output

| Model | Input Voltage (VDC) | Output Voltage (VDC) | Input Current Max (mA) | | Output Current Max (mA) | Maximum Capacitive Load (μF) | Efficiency (%) Full Load (Typ.) |
|----------------|---------------------|----------------------|------------------------|-----------|-------------------------|------------------------------|---------------------------------|
| | | | No Load | Full Load | | | |
| AM6TW-2405D-NZ | 24 (9 ~ 36) | ±5 | 5 | 305 | ±600 | 680 | 82 |
| AM6TW-2412D-NZ | 24 (9 ~ 36) | ±12 | 5 | 294 | ±250 | 470 | 85 |
| AM6TW-2415D-NZ | 24 (9 ~ 36) | ±15 | 5 | 291 | ±200 | 220 | 86 |
| AM6TW-2424D-NZ | 24 (9 ~ 36) | ±24 | 5 | 291 | ±125 | 100 | 86 |
| AM6TW-4805D-NZ | 48 (18 ~ 75) | ±5 | 5 | 150 | ±600 | 680 | 83 |
| AM6TW-4812D-NZ | 48 (18 ~ 75) | ±12 | 5 | 144 | ±250 | 470 | 87 |

| | | | | | | | |
|-------------------|--------------|-----|---|-----|------|-----|----|
| AM6TW-4815D-NZ | 48 (18 ~ 75) | ±15 | 5 | 144 | ±200 | 220 | 88 |
| AM6TW-2405DH30-NZ | 24 (9 ~ 36) | ±5 | 5 | 305 | ±600 | 680 | 82 |
| AM6TW-2412DH30-NZ | 24 (9 ~ 36) | ±12 | 5 | 294 | ±250 | 470 | 85 |
| AM6TW-2415DH30-NZ | 24 (9 ~ 36) | ±15 | 5 | 291 | ±200 | 220 | 86 |

Input Specification

| Parameters | Conditions | Typical | Maximum | Units |
|--------------------------|---|---------|---------|-------|
| Voltage range | See models table | 4:1 | | VDC |
| Filter | Pi filter | | | |
| Absolute maximum rating | 24VDC input models, 1 sec. max | | 50 | VDC |
| | 48VDC input models, 1 sec. max, 6000VDC | | 80 | VDC |
| | 48VDC input models, 1 sec. max, others | | 100 | VDC |
| Start-up voltage | Nominal 24V input models | | 9 | VDC |
| | Nominal 48V input models | | 18 | VDC |
| Under voltage protection | Nominal 24V input models | 7 | | VDC |
| | Nominal 48V input models | 15 | | VDC |

Isolation Specification

| Parameters | Conditions | Typical | Maximum | Units |
|--|---|----------------------|---------|-------|
| Tested I/O voltage | 60 sec, leakage ≤ 0.5mA, 1500VDC models | ≥1500 | | VDC |
| | 60 sec, leakage ≤ 0.5mA, 3000VDC models | ≥3000 | | VDC |
| | 60 sec, leakage ≤ 0.5mA, 6000VDC models | ≥6000 | | VDC |
| Resistance | 500VDC, 1500 & 3000VDC models | ≥1000 | | MΩ |
| | 500VDC, 6000VDC models | ≥10000 | | MΩ |
| Capacitance | I/O capacitance at 100KHz/0.1V, 1500 & 3000VDC models | 1000 | | pF |
| | I/O capacitance at 100KHz/0.1V, 6000VDC models | 20 | | pF |
| Isolation creepage and clearances (6000VDC models) | PCB Clearance and Creepage | ≥8.0 | | |
| | Optocoupler Creepage | ≥8.0 | | |
| | Transformer Creepage | ≥8.0 | | |
| | Transformer Clearance | ≥5.0 | | |
| Insulation system | 6000VDC models | Reinforced isolation | | |
| Leakage current | 6000VDC models, 240VAC/60Hz | 4 | | μA |
| Protection grade | 6000VDC models, 240VAC/60Hz | 2xMOPP | | |
| Applied part | 6000VDC models | Type CF | | |

Output Specification

| Parameters | Conditions | Typical | Maximum | Units |
|--------------------------|-----------------------|-------------------|---------|--------|
| Voltage Tolerance | | ± 1 | ± 3 | % |
| Line regulation | | | ± 0.5 | % |
| Load regulation | Single 10 ~ 100% load | | ± 0.8 | % |
| | Dual 10 ~ 100% load | | ± 1.0 | % |
| Over current protection | | 110~210, typ. 140 | | % Iout |
| Short circuit protection | Continuous | | | |

| | | | | |
|-------------------------|----------------------|------------|------------|----------|
| Over-voltage protection | Input voltage range | ≥ 110 | 160 | %Vo |
| Temperature coefficient | Full load | | ± 0.03 | %/°C |
| Ripple & Noise | 20MHz bandwidth | | 100 | mV pk-pk |
| Transient recovery time | 50% load step change | 350 | | μ S |

General Specifications

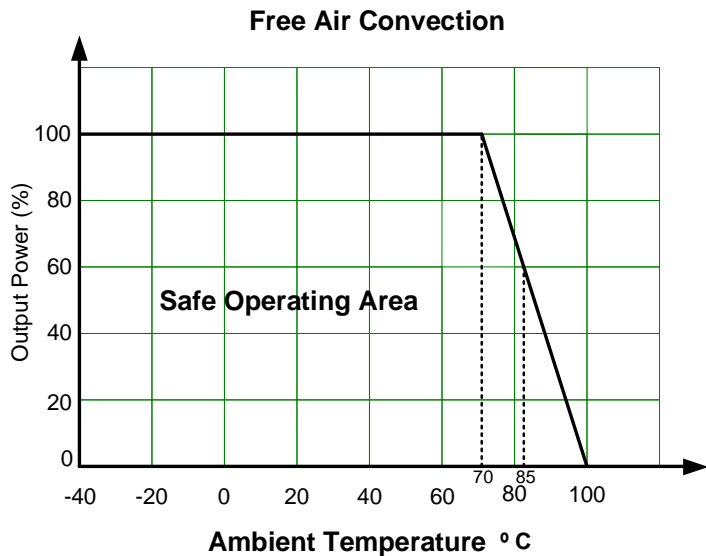
| Parameters | Conditions | Typical | Maximum | Units |
|------------------------|---|---|---------|-------|
| Switching frequency | | 330 | | KHz |
| Operating temperature | See derating graph | -40 to +85 | | °C |
| Storage temperature | | -55 to +125 | | °C |
| Soldering temperature | 1.5mm from case 10 sec max | | 300 | °C |
| Cooling | Free air convection | | | |
| Humidity | Non-condensing | | 95 | % RH |
| Case material | 1500VDC models | Nickel coated with non-conductive base | | |
| | 3000 & 6000VDC models | Black plastic (flammability to UL 94V-0) | | |
| Weight | 1500VDC models | 16.8 | | g |
| | 3000 & 6000VDC models | 12.8 | | g |
| Dimensions (L x W x H) | 1500VDC models | 1.24 x 0.79 x 0.43 inches (31.6 x 20.1 x 11.0 mm) | | |
| | 3000 & 6000VDC models | 1.25 x 0.80 x 0.40 inches (31.8 x 20.3 x 10.2 mm) | | |
| MTBF | > 1 500 000 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.

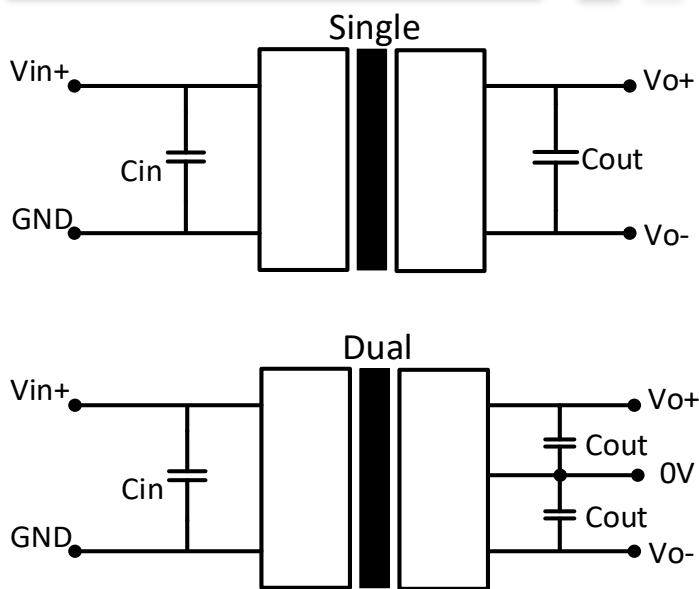
Safety Specifications

| Parameters | | |
|------------|---|---|
| Standards | EN60601-1: 2006+A1: 2013 (6000VDC models) | |
| | EN62368-1 (1500VDC & 3000VDC models) | |
| | EMC - Conducted and radiated emission | CISPR32/EN55032, CLASS B with EMC recommended circuit |
| | Electrostatic Discharge Immunity | IEC 61000-4-2 Contact $\pm 4\text{KV}$, Criteria B (1500 & 3000VDC models) IEC 61000-4-2 Contact $\pm 6\text{KV}$, Criteria B (6000VDC models) |
| | Electrical Fast Transient/Burst Immunity | IEC/EN61000-4-4 $\pm 2\text{KV}$, Criteria B (6000VDC models) |
| | Surge Immunity | IEC/EN61000-4-5 $\pm 2\text{KV}$, Criteria B (6000VDC models) |
| | RF, Conducted Disturbance Immunity | IEC/EN61000-4-6 3 Vr.m.s, Criteria A (6000VDC models) |

Derating



Typical Application Circuit



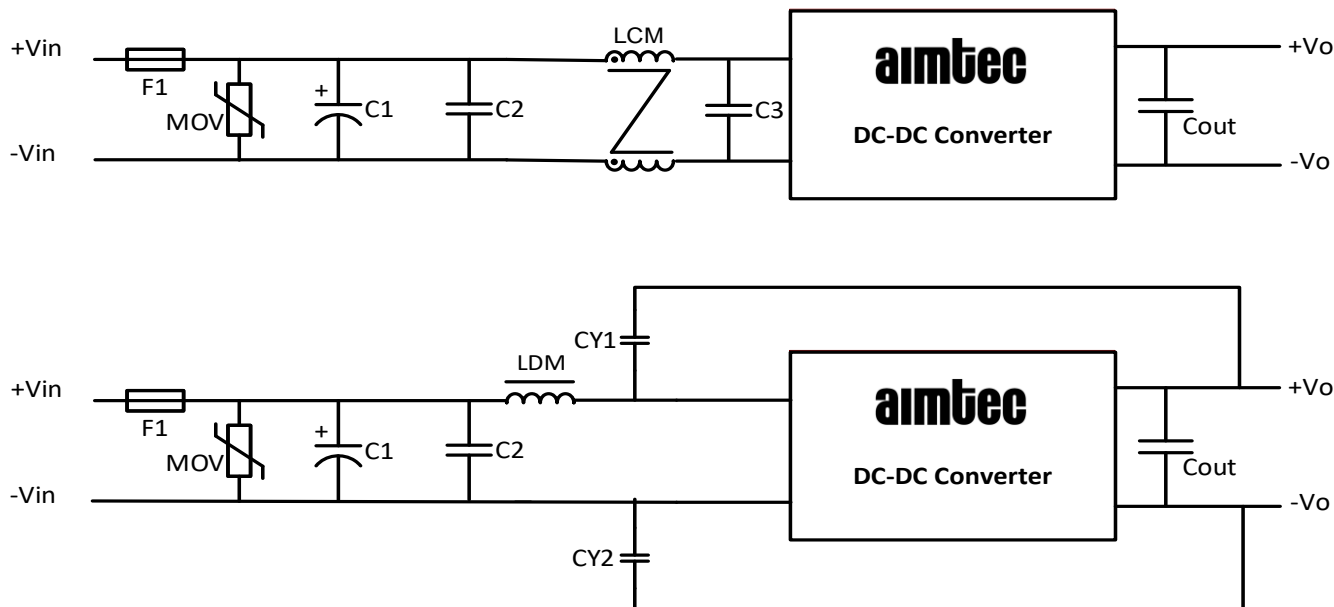
| V_{in} | C_{in} |
|----------|-----------------|
| 24VDC | 10 μ F/100V |
| 48VDC | 10 μ F/100V |

| Single Vout | C_{out} |
|-------------|-----------------|
| 3.3VDC | 100 μ F/50V |
| 5VDC | |
| 6VDC | |
| 9VDC | |
| 12VDC | |
| 15VDC | |
| 24VDC | |

| Dual Vout | C_{out} |
|-------------|-----------------------|
| \pm 5VDC | \pm 100 μ F/50V |
| \pm 12VDC | |
| \pm 15VDC | |
| \pm 24VDC | |

EMC Recommended Circuit

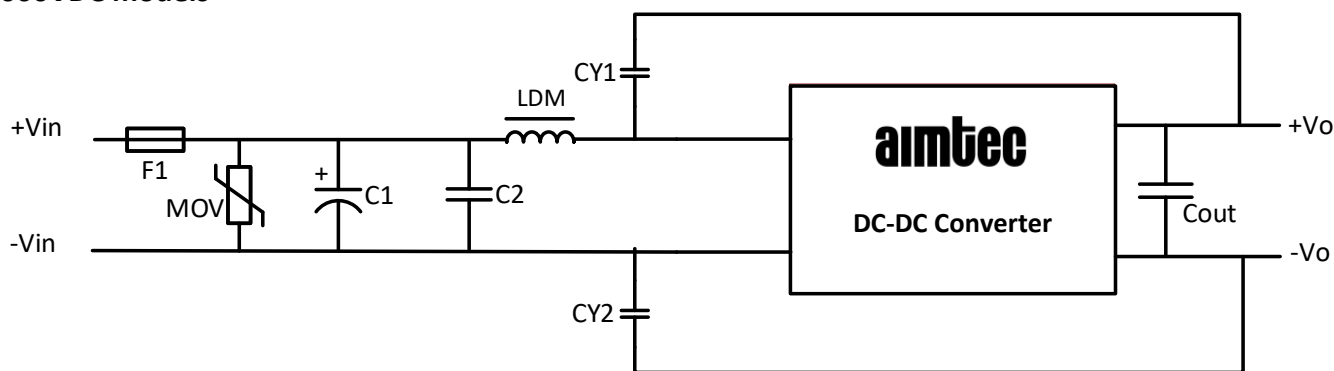
1500VDC & 3000VDC models



| Vin | MOV | C1 | C2, C3 | LCM | LDM | CY1, CY2 |
|----------------|--------|------------------|------------------|-------|-------------|----------|
| 24VDC (single) | S20K30 | 330 μ F/50V | 2.2 μ F/50V | 2.2mH | -- | -- |
| 48VDC (single) | S14K60 | 100 μ F/100V | 2.2 μ F/100V | 2.2mH | -- | -- |
| 24VDC (dual) | S20K30 | 330 μ F/50V | 1 μ F/50V | -- | 4.7 μ H | 1nF/3kV |
| 48VDC (dual) | S14K60 | 330 μ F/100V | 1 μ F/100V | -- | 4.7 μ H | 1nF/3kV |

Fuse chose according to actual input current

6000VDC models

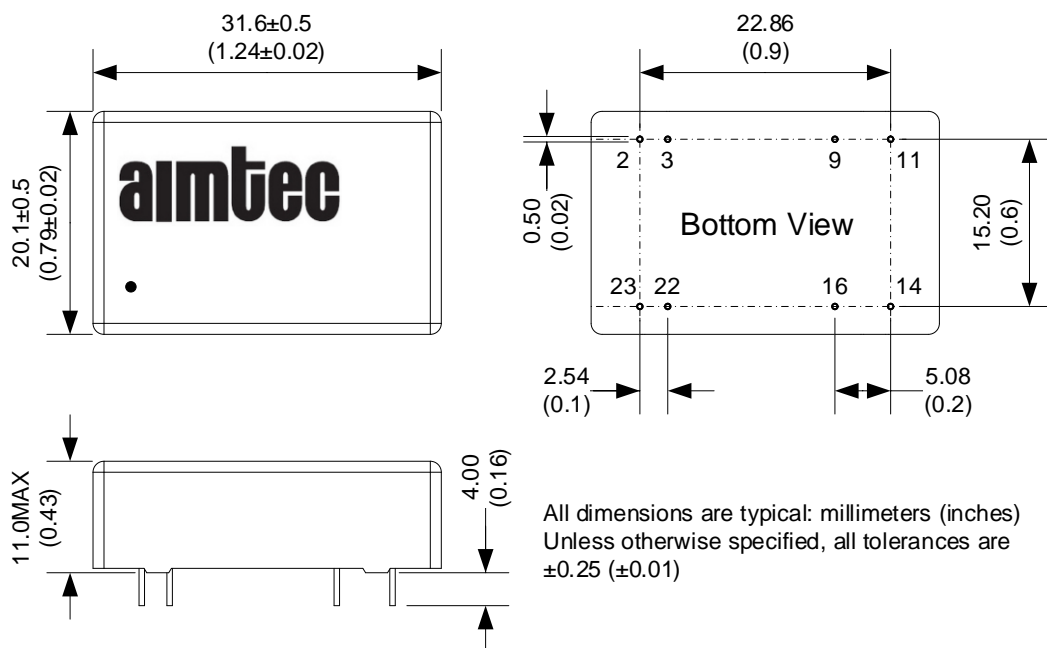


| Vin | MOV | C1 | C2 | LDM | CY1, CY2 |
|-------|--------|------------------|------------------|------------|----------|
| 24VDC | S20K30 | 330 μ F/50V | 2.2 μ F/50V | 10 μ H | 1nF |
| 48VDC | S14K60 | 100 μ F/100V | 2.2 μ F/100V | 10 μ H | 1nF |

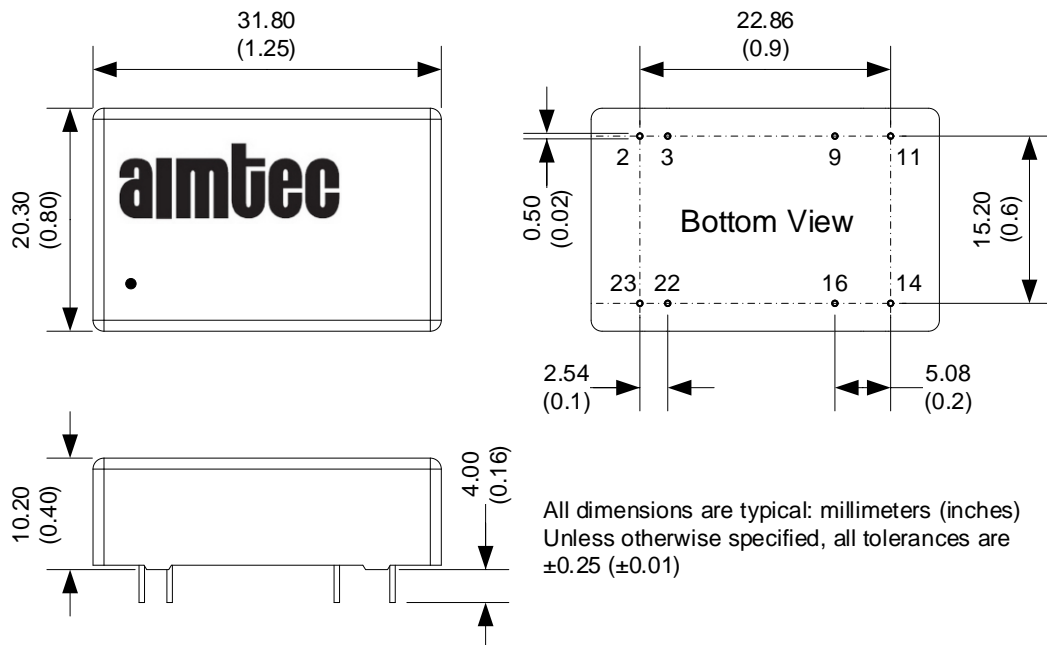
Fuse chose according to actual input current

Dimensions

1500VDC models:

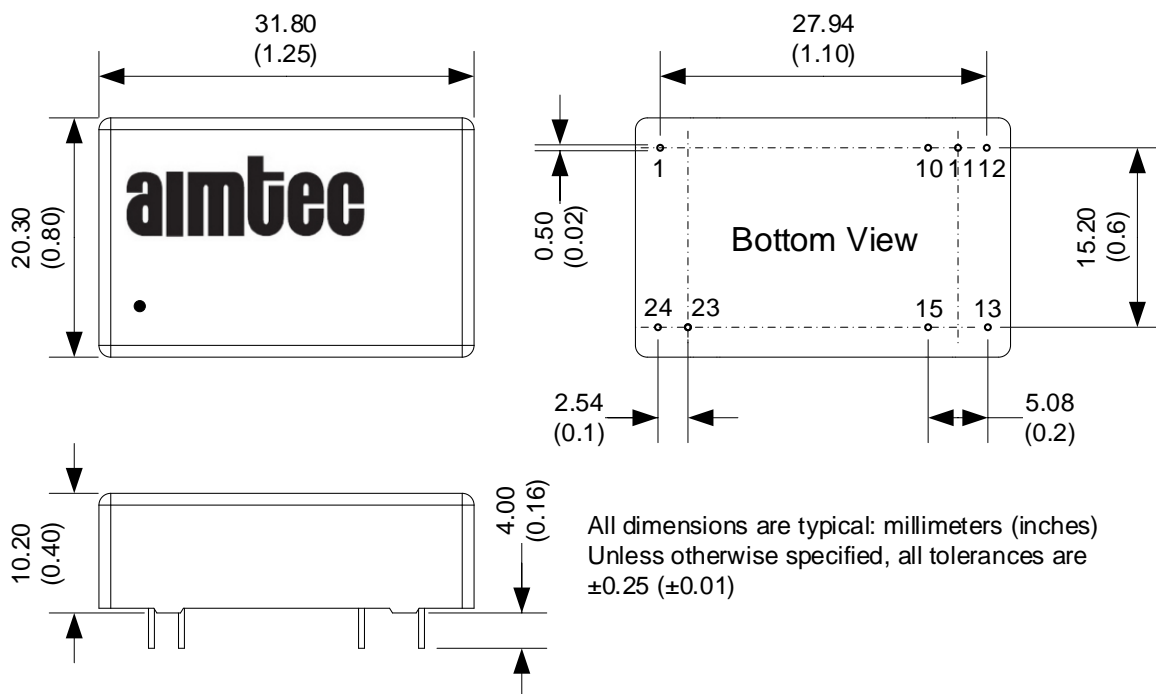


3000VDC models:



| Pin Out Specifications 1500VDC & 3000VDC | | |
|---|---------------|-------------|
| Pin | Single output | Dual output |
| 2 | -V Input | -V Input |
| 3 | -V Input | -V Input |
| 9 | NP | COM |
| 11 | NC | -V Output |
| 14 | +V Output | +V Output |
| 16 | -V Output | Common |
| 22 | +V Input | +V Input |
| 23 | +V Input | +V Input |

6000VDC models:



| Pin Out Specifications 6000VDC | |
|-----------------------------------|---------------|
| Pin | Single output |
| 1 | +V Input |
| 10 | NP |
| 11 | NP |
| 12 | -V Output |
| 13 | +V Output |
| 15 | NP |
| 23 | -V Input |
| 24 | -V Input |

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