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# AM10TWM-YZ




Encapsulated

Aimtec launched the AM10TWM-YZ, a 10W medical grade DC/DC converterinaDIP24 case to satisfy the rigorous power demands of medical equipment. This series meets EN60601-1-2:2015 medical safety standard and has ahigh I/O isolation of 5000VAC with reinforced insulation rated for a 250VAC working voltage and 2xMOPP.

This 10W converter has 4:1 input (9-36V & 18-75V), single & dual outputs (3.3...15V, =/-5...+/-15V). In terms of safety, this series has output short circuit, overvoltage & overcurrent protections.

Our medical can be used in applications such as medical assisting devices, computed tomography, ultrasound machinery and other medical ancillary equipment.

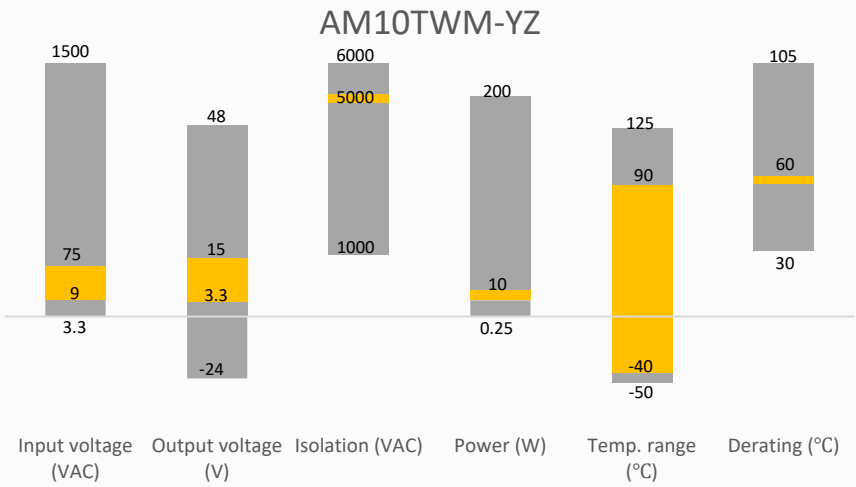
## Features

- 4:1Wide input voltage
- High efficiency to 85%
- Operating temperature: -40°Cto+90°C
- Meet medical EMC standard of EMI EN 55011, Class A
- Meet medical EMC standard of EMS EN 60601-1-2:2015
- I/O Isolation of 5000VAC with reinforced insulation rated for 250VAC and 2xMOPP

RoHS

3yr Warranty

## Summary




## Training

Product Training Video (click to open)

Press Release

Coming Soon!

Application Notes

## Applications

Medical

Industrial

# Models & Specifications

## Single Output

| Model | Input Voltage (VDC) | Output Voltage (VDC) | Input Current max (mA) | Output Current max (A) | Isolation (VAC) | Maximum capacitive Load (µF) | Efficiency (%) |
|---|---|---|---|---|---|---|---|
| AM10TWM-2403SH50YZ | 24 (9 - 36) | 3.3 | 414 | 2.5 | 5000 | 4700 | 83 |
| AM10TWM-2405SH50YZ | 24 (9 - 36) | 5 | 496 | 2 | 5000 | 2500 | 84 |
| AM10TWM-2412SH50YZ | 24 (9 - 36) | 12 | 496 | 0.833 | 5000 | 430 | 84 |
| AM10TWM-2415SH50YZ | 24 (9 - 36) | 15 | 499 | 0.67 | 5000 | 270 | 84 |
| AM10TWM-4803SH50YZ | 48 (18 - 75) | 3.3 | 207 | 2.5 | 5000 | 4700 | 83 |
| AM10TWM-4805SH50YZ | 48 (18 - 75) | 5 | 248 | 2 | 5000 | 2500 | 84 |
| AM10TWM-4812SH50YZ | 48 (18 - 75) | 12 | 248 | 0.833 | 5000 | 430 | 84 |
| AM10TWM-4815SH50YZ | 48 (18 - 75) | 15 | 249 | 0.67 | 5000 | 270 | 84 |

## Dual Output

| Model | Input Voltage (VDC) | Output Voltage (VDC) | Input Current max (mA) | Output Current max (A) | Isolation (VAC) | Maximum capacitive Load (µF) | Efficiency (%) |
|---|---|---|---|---|---|---|---|
| AM10TWM-2405DH50YZ | 24 (9 - 36) | ±5 | 496 | ±1.0 | 5000 | ±1250 | 84 |
| AM10TWM-2412DH50YZ | 24 (9 - 36) | ±12 | 494 | ±0.42 | 5000 | ±220 | 85 |
| AM10TWM-2415DH50YZ | 24 (9 - 36) | ±15 | 500 | ±0.34 | 5000 | ±135 | 85 |
| AM10TWM-4805DH50YZ | 48 (18 - 75) | ±5 | 248 | ±1.0 | 5000 | ±1250 | 84 |
| AM10TWM-4812DH50YZ | 48 (18 - 75) | ±12 | 247 | ±0.42 | 5000 | ±220 | 85 |
| AM10TWM-4815DH50YZ | 48 (18 - 75) | ±15 | 250 | ±0.34 | 5000 | ±135 | 85 |

## Input Specification

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Voltage range | Nominal 24V<br>Nominal 48V | 9 – 36<br>18 - 75 | | VDC |
| Filter | Pi network | | | |
| Startup time | Nominal input and resistive load | 0.015 | | S |
| Absolute maximum rating | 24V models, 100mS<br>48V models, 100mS | | 50<br>100 | VDC |
| Input reflected ripple current | 5 to 20MHz, 12µH source impedance | | 35 | mA pk-pk |
| On/Off Control | ON – 0 to 1.2Vdc or open;<br>OFF – 2.2 to 12Vdc, idle current 4mA typ. | | | |

## Isolation Specification

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Tested I/O voltage | 60 sec | 5000 | | VAC |
| Resistance | 500Vdc | >1000 | | MOhm |
| Capacitance | | 20 | | pF |

## Output Specification

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Voltage accuracy | | | ±2 | % |
| Cross regulation (Dual) | 25% to 100% load on one output, 100% load on second output | | ±5 | % |
| Line regulation | Full load, main input range | | ±0.5 | % |
| Load regulation | 0-100% load | | ±0.5 | % |
| Voltage adjustment | | | ±10 | %Vout |
| Short circuit protection | Continuous, Auto recovery | | | |
| Over current protection | | 150 | | % of Iout |
| Over voltage protection | Zener clamped | | | |
| Temperature coefficient | | ±0.02 | | %/ °C |
| Ripple & Noise* | 20MHz bandwidth | | 100 | mV pk-pk |
| Transient recovery time | 25% load step change | | 350 | µS |
| Transient response deviation | 25% load step change | ±3 | ±5 | % |

* 20MHz bandwidth

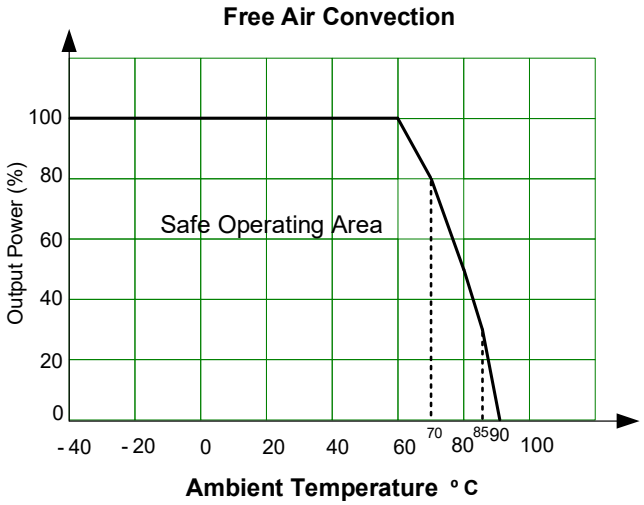
## General Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|---|---|---|---|---|
| Switching frequency | 100% load | 300 | | KHz |
| Operating temperature | See derating graph | -40 to +90 | | °C |
| Storage temperature | | -55 to +125 | | °C |
| Maximum case temperature | | | 95 | °C |
| Lead temperature | 1.5mm from case 10 sec. | | 260 | °C |
| Cooling | Free air convection | | | |
| Humidity | Non-condensing | 95 | | % RH |
| Case material | Heat resistant black Plastic (flammability to UL 94V-0) | | | |
| Weight | | 15.5 | | g |
| Dimensions (L x W x H) | 1.24 x 0.79 x 0.39 inches, 31.60 x 20.10 x 10.00mm | | | |
| MTBF | > 900 000 hrs (MIL-HDBK -217F, t=+25°C)/Full Load | | | |

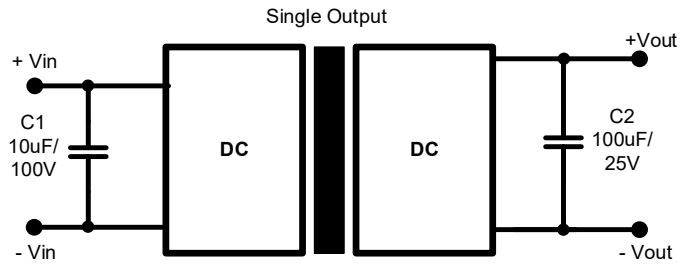
All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

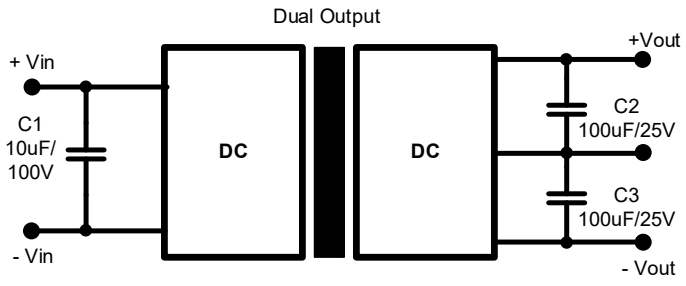
| Safety Specifications | | |
|---|---|---|
| **Parameters** | | |
| **Standards** | EMC - Conducted and radiated emission | Design to meet EN55011, class A<br>Design to meet EN60601-1-2:2015 |
| | Electrostatic Discharge Immunity* | IEC 61000-4-2 Contact ±8KV / Air ±15KV, Criteria A |
| | RF, Electromagnetic Field Immunity* | IEC 61000-4-3 10V/m, Criteria A |
| | Electrical Fast Transient/Burst Immunity* | IEC 61000-4-4 ±2KV, Criteria A |
| | Surge Immunity* | IEC 61000-4-5 L-L ±2KV, Criteria A |
| | RF, Conducted Disturbance Immunity* | IEC 61000-4-6 10Vr.m.s, Criteria A |
| | Voltage dips, Short Interruptions Immunity* | IEC 61000-4-8 30A/m, Criteria A |
| * With added EMC recommended circuit, which can meet EN60601 standard | | |

## Derating

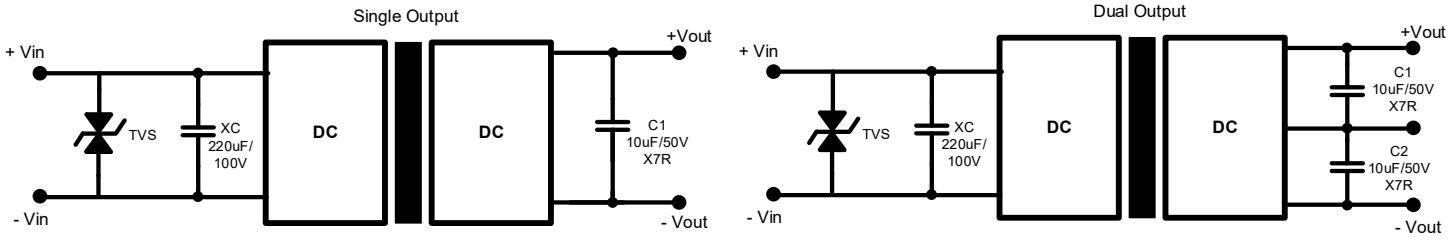



## Typical Application Circuit



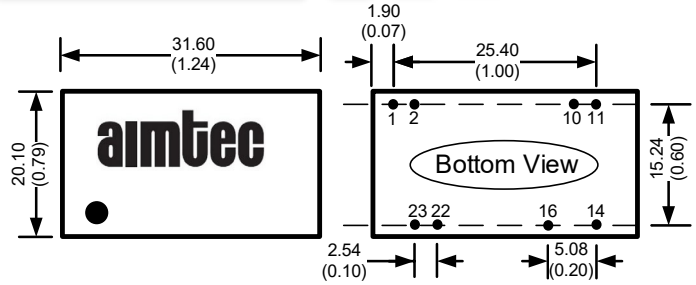



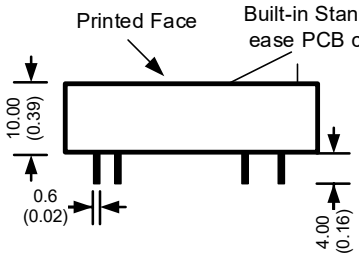
## EMC Recommended Circuit




| Model | TVS |
|---|---|
| 24V Input models | 3.0SMCJ58AG |
| 48V Input models | 3.0SMCJ120AG |

## Dimensions



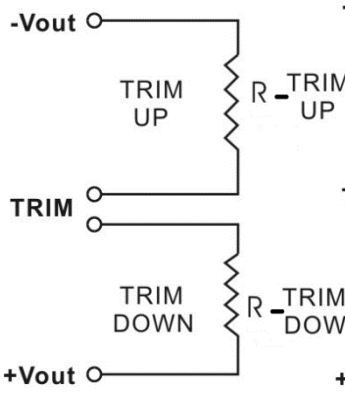




All dimensions are typical: millimeters (inches)
Pin Diameter: 0.50 ± 0.10 (0.02 ± 0.004)
Pin Pitch Tolerance: ± 0.35 (±0.014)
Case Tolerance: ± 0.5 (±0.02)

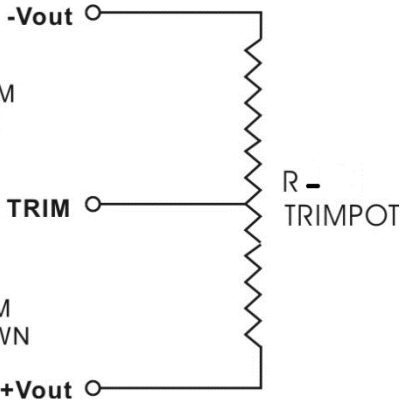
| Pin Output Specifications | | |
|---|---|---|
| Pin | Single | Dual |
| 1 | ON/OFF | ON/OFF |
| 2 | -V Input | -V Input |
| 10 | Trim | Trim |
| 11 | NC | -V Output |
| 14 | +V Output | +V Output |
| 16 | -V Output | Common |
| 22 | +V Input | +V Input |
| 23 | +V Input | +V Input |

# Trim

**Fixed Resistor**




**Variable Potentiometer**




For 3.3V single output model

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vout (VDC) | 3.308 | 3.275 | 3.241 | 3.208 | 3.174 | 3.141 | 3.108 | 3.074 | 3.041 | 3.007 |
| Rt down (KΩ) | 152.44 | 70.36 | 43.01 | 29.33 | 21.12 | 15.65 | 11.74 | 8.808 | 6.53 | 4.7 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 3.375 | 3.408 | 3.442 | 3.475 | 3.509 | 3.542 | 3.575 | 3.609 | 3.642 | 3.676 |
| Rt up (KΩ) | 87.75 | 39.33 | 23.18 | 15.11 | 10.27 | 7.04 | 4.74 | 3.007 | 1.66 | 0.59 |

For 5V single output model

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vout (VDC) | 4.95 | 4.9 | 4.85 | 4.8 | 4.75 | 4.7 | 4.65 | 4.6 | 4.55 | 4.5 |
| Rt down (KΩ) | 229.9 | 102.4 | 59.9 | 38.65 | 25.9 | 17.4 | 11.33 | 6.775 | 3.23 | 0.4 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 5.05 | 5.1 | 5.15 | 5.2 | 5.25 | 5.3 | 5.35 | 5.4 | 5.45 | 5.5 |
| Rt up (KΩ) | 235 | 107.5 | 65 | 43.75 | 31 | 22.5 | 16.43 | 11.875 | 8.33 | 5.5 |

For 12V single output model

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vout (VDC) | 11.947 | 11.827 | 11.706 | 11.585 | 11.465 | 11.344 | 11.223 | 11.102 | 10.982 | 10.861 |
| Rt down (KΩ) | 946.72 | 455.16 | 291.31 | 209.38 | 160.22 | 127.45 | 104.05 | 86.49 | 72.84 | 61.91 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 12.189 | 12.309 | 12.43 | 12.551 | 12.671 | 12.792 | 12.913 | 13.033 | 13.154 | 13.275 |
| Rt up (KΩ) | 232.88 | 104.44 | 61.63 | 40.22 | 27.38 | 18.81 | 12.7 | 8.11 | 4.54 | 1.69 |

For 15V single output model

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vout (VDC) | 14.85 | 14.7 | 14.55 | 14.4 | 14.25 | 14.1 | 13.95 | 13.8 | 13.65 | 13.5 |
| Rt down (KΩ) | 1,332.40 | 644.9 | 415.73 | 301.15 | 232.4 | 186.57 | 153.83 | 129.275 | 110.18 | 94.9 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 15.15 | 15.3 | 15.45 | 15.6 | 15.75 | 15.9 | 16.05 | 16.2 | 16.35 | 16.5 |
| Rt up (KΩ) | 248.9 | 111.4 | 65.57 | 42.65 | 28.9 | 19.73 | 13.19 | 8.275 | 4.46 | 1.4 |

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