

- Compact 1.6 × 1.0 " plastic case
- Ultra wide 4:1 input voltage range
- I/O isolation 5000 VACrms rated for 250 VACrms working voltage
- Certification according to IEC/EN/ES 60601-1 3rd edition for 2×MOPP
- EMC compliance to IEC 60601-1-2 4th edition
- Risk management process according to ISO 14971 including risk management file
- Acceptance criteria for electronic assemblies according to IPC-A-610 Level 3
- Low leakage current < 2.5 µA
- Extended operating temperature range –40°C to 85°C.
- Input filter to meet EN55032 class A
- Operating up to 5000 m altitude
- 5 year product warranty



The THM 15WI series is a range of medical 15 Watt DC/DC converters in 1.6" x 1.0" plastic package and with wide 4:1 input voltage range. They provide a reinforced isolation system for 5000 VACrms isolation and a very low leakage current of less than 2.5 µA. The units are approved to IEC/EN/ES 60601-1 3rd edition for 2 × MOPP (Means Of Patient Protection) and come along with an ISO 14971 risk management file. Design and production conform to the quality management system ISO 13485. With a high efficiency of up to 90% and highest grade components the converters can reliably operate in an ambient temperature range of –40°C up to +85°C. They constitute a reliable solution not only for medical equipment but also for demanding ranges of application such as transportation, control & measurement or IGBT drivers.

| Models | | | | |
|---------------|----------------------------------|----------------|---------------------|-----------------|
| Order code | Input voltage range | Output voltage | Output current max. | Efficiency typ. |
| THM 15-2410WI | 9.0 – 36 VDC (24 VDC nominal) | 5.0 VDC | 3000 mA | 87.0 % |
| THM 15-2412WI | | 12 VDC | 1250 mA | 88.5 % |
| THM 15-2413WI | | 15 VDC | 1000 mA | 88.0 % |
| THM 15-2415WI | | 24 VDC | 625 mA | 88.0 % |
| THM 15-2421WI | | ±5 VDC | ±1500 mA | 86.0 % |
| THM 15-2422WI | | ±12 VDC | ±625 mA | 88.0 % |
| THM 15-2423WI | | ±15 VDC | ±500 mA | 88.0 % |
| THM 15-4810WI | 18 – 75 VDC (48 VDC nominal) | 5.0 VDC | 3000 mA | 89.5 % |
| THM 15-4812WI | | 12 VDC | 1250 mA | 88.0 % |
| THM 15-4813WI | | 15 VDC | 1000 mA | 88.0 % |
| THM 15-4815WI | | 24 VDC | 625 mA | 88.5 % |
| THM 15-4821WI | | ±5 VDC | ±1500 mA | 86.0 % |
| THM 15-4822WI | | ±12 VDC | ±625 mA | 88.5 % |
| THM 15-4823WI | | ±15 VDC | ±500 mA | 88.0 % |

Input Specifications

| | | |
|--|--|--|
| Input current no load | 24 Vin models: 13 mA typ. 48 Vin models: 10 mA typ. | |
| Surge voltage (3 sec. max.) | 24 Vin models: 50 V max. 48 Vin models: 100 V max. | |
| Start-up voltage | 24 Vin models: 9 VDC (or lower) 48 Vin models: 18 VDC (or lower) | |
| Startup time | 60 ms max. (30 ms typ.) | |
| Under voltage shut down (lock-out circuit) | 24 Vin models: 7.8 - 8.6 VDC 48 Vin models: 15.8 - 17.4 VDC | |
| Input filter | Pi-type | |
| Conducted noise | EN 55011 limits to IEC 60601-1-2 4th edition EN55032 class A (internal filter) EN55032 class B with external components www.tracopower.com/overview/thm15wi – Filter proposal | |
| EMC immunity | – Generic for Medical equipment – ESD (electrostatic discharge) – Radiated immunity – Fast transient / surge (with external input capacitor / diode) – Conducted immunity – Magnetic field immunity | IEC/EN 60601-1-2 4th edition EN 61000-4-2, air ± 15 kV, contact ± 8 kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 2 kV perf. criteria A 24 Vin models: Nippon chemi-con KY 220 μ F/ 100 V TVS - SMDJ58A, 58V, 3000 W) 48 Vin models: Nippon chemi-con KY 220 μ F/ 100 V TVS - SMDJ120A, 120V, 3000 W) EN 61000-4-6, 10 Vrms, perf. criteria A EN 61000-4-8 100 A/m, continuous, perf. criteria A 1000 A/m, 1 sec., perf. criteria A |
| External input fuse required (recommended values, slow blow type) | 24 Vin models: 3.15 A 48 Vin models: 1.6 A | |

Output Specifications

| | |
|--|--|
| Voltage set accuracy | ± 1 % max. |
| Output voltage adjustment range (single output models only) | 5 & 12 VDC models: ± 10 % 15 & 24 VDC models: $-10 / +20$ % |
| Regulation | – Input variation single output: 0.2 % max. dual output: 0.5 % max. – Load variation 0 – 100 % single output: 0.2 % max. dual output: 1.0 % max. – Cross regulation dual output: 5.0 % max. (asymmetrical load 25/100%) |
| Temperature coefficient | ± 0.02 %/K typ. |
| Minimum load | not required |
| Ripple and noise (20 MHz Bandwidth) | (\pm)5.0 VDC models: 50 mVp-p typ. with cap. 10 μ F/25V X7R MLCC (\pm)12 VDC models: 75 mVp-p typ. with cap. 10 μ F/25V X7R MLCC (\pm)15 VDC models: 75 mVp-p typ. with cap. 10 μ F/25V X7R MLCC 24 VDC models: 100 mVp-p typ. with cap. 4.7 μ F/50V X7R MLCC |
| Transient response | – Recovery time (25% load step change) 250 μ s typ. |
| Overload protection | at 150 % typ. of lout rated (hiccup mode) |
| Short-circuit protection | Continuous, automatic recovery |

General Specifications

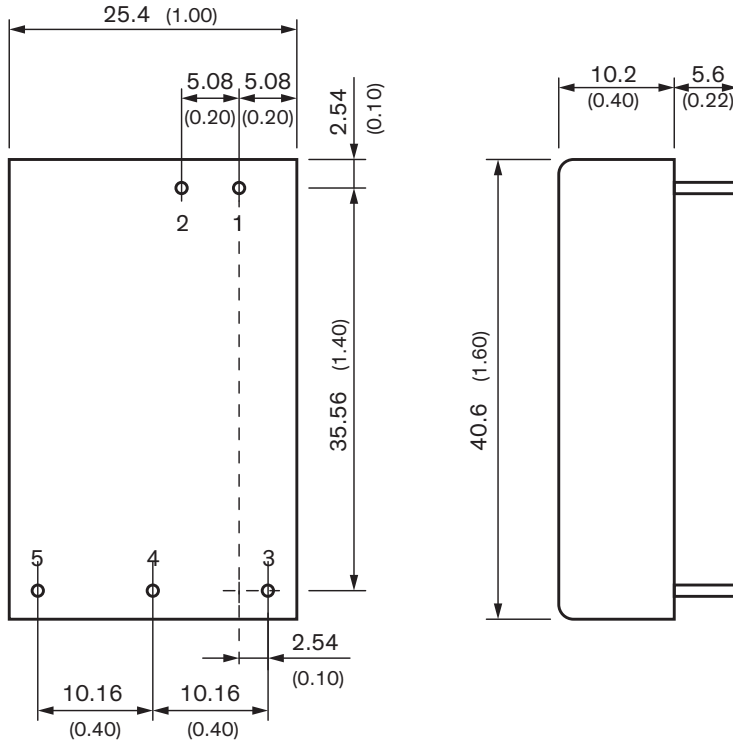
| | | |
|--|--|---|
| Overvoltage protection | (±)5.0 VDC models: (±)12 VDC models: (±)15 VDC models: 24 VDC models: | 6.2 VDC typ. 15 VDC typ. 20 VDC typ. 30 VDC typ. |
| Capacitive load | –Single output –Dual output | 5.0 VDC models: 3'800 µF max. 12 VDC models: 650 µF max. 15 VDC models: 530 µF max. 24 VDC models: 190 µF max. ±5 VDC models: 1'900 µF max. (each output) ±12 VDC models: 380 µF max. (each output) ±15 VDC models: 270 µF max. (each output) |
| Temperature ranges | – Operating – Case temperature – Storage temperature | –40°C to +85°C +105°C max. –55°C to +125°C |
| Derating | | 2.86% above 65°C |
| Overtemperature protection | | at 115°C typ. |
| Thermal impedance | | 15.30 °C/W |
| Humidity (non condensing) | | 5 % to 95 % rel H max. |
| Isolation voltage (50 Hz, 60 s) | | 5000 VACrms, reinforced |
| Clearance/creepage | | 8 mm min. |
| Leakage current (at 240VAC, 60Hz) | | 2.5 µA max. |
| Isolation capacitance (input/output) | | 20 pF typ. |
| Altitude during operation | | 5000 m |
| Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign) | | tbd |
| Switching frequency | | 250 kHz typ. (pulse width modulation) |
| Vibration and thermal shock resistance | | according to MIL-STD-810F |
| Safety standards/approvals | – Medical equipment – Certification documents | ANSI/AAMI ES 60601-1:2005/(R)2012, IEC/EN 60601-1 3rd edition www.tracopower.com/overview/thm15wi |
| Environmental compliance | – Reach – RoHS | www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU |

Physical Specifications

| | |
|-----------------------|---------------------------|
| Casing material | non-conductive plastic |
| Base material | non-conductive plastic |
| Potting material | silicone (UL94 V-0 rated) |
| Package weight | 24 g (0.85oz) |
| Soldering temperature | max. 265°C / 10 sec |

All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Outline Dimensions



| Pinout | | |
|--------|------------|------------|
| Pin | Single | Dual |
| 1 | +Vin (Vcc) | +Vin (Vcc) |
| 2 | -Vin (GND) | -Vin (GND) |
| 4 | +Vout | +Vout |
| 5 | -Vout | Common |
| 6 | Trim | -Vout |

Dimensions in [mm], () = Inch
 Tolerances ± 0.5 (± 0.02)
 ± 0.25 (± 0.01)
 Pin pitch tolerances ± 0.25 (± 0.01)
 Pin \varnothing 1.0 ± 0.1 (0.04 ± 0.004)