

- Ultra wide 4:1 input voltage 10 W DC/DC converter in a compact DIP-24 plastic case
- I/O isolation 5000 VAC rated for 250 VAC working voltage
- Certification according to IEC/EN/ES 60601-1 3rd edition for 2 x MOPP
- Risk management process according to ISO 14971 incl. risk management file
- Acceptance criteria for electronic assemblies acc. to IPC-A-610 Level 3
- Low leakage current <2 μ A
- Operating temperature -40°C to 90°C
- EMC compliance to IEC 60601-1-2 4th edition and EN55032 class A
- Operating up to 5000m altitude
- 5-year product warranty



ES 60601-1 IEC 60601-1

The THM 10WI series is a range of medical 10 Watt DC/DC converters in DIP-24 plastic package and with ultra-wide 4:1 input voltage range. They provide a reinforced isolation system for 5000 VAC isolation and a very low leakage current of less than 2 μ A. The units are approved to IEC/EN/ES 60601-1 3rd edition for 2 x 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 87% and highest grade components the converters can reliably operate in an ambient temperature range of -40°C up to $+90^{\circ}\text{C}$. 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 1		Output 2		Efficiency typ.
		Vnom	I _{max}	Vnom	I _{max}	
THM 10-0510WI	4.5 - 9 VDC (5 VDC nom.)	3.3 VDC	2'500 mA			80 %
THM 10-0511WI		5 VDC	2'000 mA			84 %
THM 10-0512WI		12 VDC	830 mA			87 %
THM 10-0513WI		15 VDC	670 mA			87 %
THM 10-0515WI		24 VDC	416 mA			86 %
THM 10-0521WI		+5 VDC	1'000 mA	-5 VDC	1'000 mA	83 %
THM 10-0522WI		+12 VDC	416 mA	-12 VDC	416 mA	86 %
THM 10-0523WI		+15 VDC	333 mA	-15 VDC	333 mA	87 %
THM 10-2410WI	9 - 36 VDC (24 VDC nom.)	3.3 VDC	2'500 mA			83 %
THM 10-2411WI		5 VDC	2'000 mA			87 %
THM 10-2412WI		12 VDC	830 mA			89 %
THM 10-2413WI		15 VDC	670 mA			89 %
THM 10-2415WI		24 VDC	416 mA			89 %
THM 10-2421WI		+5 VDC	1'000 mA	-5 VDC	1'000 mA	85 %
THM 10-2422WI		+12 VDC	416 mA	-12 VDC	416 mA	89 %
THM 10-2423WI		+15 VDC	333 mA	-15 VDC	333 mA	88 %
THM 10-4810WI	18 - 75 VDC (48 VDC nom.)	3.3 VDC	2'500 mA			83 %
THM 10-4811WI		5 VDC	2'000 mA			87 %
THM 10-4812WI		12 VDC	830 mA			89 %
THM 10-4813WI		15 VDC	670 mA			89 %
THM 10-4815WI		24 VDC	416 mA			89 %
THM 10-4821WI		+5 VDC	1'000 mA	-5 VDC	1'000 mA	85 %
THM 10-4822WI		+12 VDC	416 mA	-12 VDC	416 mA	88 %
THM 10-4823WI		+15 VDC	333 mA	-15 VDC	333 mA	88 %

Start-up Time	30 ms typ.
Short Circuit Protection	Continuous, Automatic recovery
Output Current Limitation	150% typ. of I _{out} max.
Overvoltage Protection	112 - 152% of V _{out} nom. (depending on model) 3.7 - 5 VDC (3.3 VDC model) 5.6 - 7 VDC (5 VDC model) 13.5 - 16 VDC (12 VDC model) 18.3 - 22 VDC (15 VDC model) 29.1 - 34.5 VDC (24 VDC model) 5.6 - 7 VDC (±5 VDC model) 13.5 - 18.2 VDC (±12 VDC model) 17 - 22 VDC (±15 VDC model)
Transient Response	- Response Time
	250 μs typ. (25% Load Step)

Safety Specifications

Safety Standards	- Medical Equipment	EN 60601-1 IEC 60601-1 ANSI/AAMI ES 60601-1 2 x MOPP (Means Of Patient Protection)
	- Certification Documents	www.tracopower.com/overview/thm10wi
Pollution Degree		PD 2
Over Voltage Category		OVC II

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 60601-1-2 edition 4 (Medical Devices) EN 55011 class A (internal filter) EN 55011 class B (with external filter) EN 55032 class A (internal filter) EN 55032 class B (with external filter) FCC Part 18 class A (internal filter) FCC Part 18 class B (with external filter)
	- Radiated Emissions	EN 55011 class A (internal filter) EN 55011 class B (with external filter) EN 55032 class A (internal filter) EN 55032 class B (with external filter) FCC Part 18 class A (internal filter) FCC Part 18 class B (with external filter)
		External filter proposal: www.tracopower.com/overview/thm10wi
EMS Immunity	- Electrostatic Discharge	EN 60601-1-2 edition 4 (Medical Devices) Air: EN 61000-4-2, ±15 kV, perf. criteria A Contact: EN 61000-4-2, ±8 kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±2 kV, perf. criteria A
		Ext. input component: 5 V _{in} models: KY 1000 μF // Vishay V10P45 24 V _{in} models: KY 470 μF 48 V _{in} models: KY 330 μF
	- Conducted RF Disturbances	EN 61000-4-6, 10 V _{rms} , perf. criteria A
	- PF Magnetic Field	Continuous: EN 61000-4-8, 100 A/m, perf. criteria A 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A

General Specifications

Relative Humidity	95% max. (non condensing)
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All specifications valid at nominal voltage, full load and +25°C after warm-up time unless otherwise stated.

Temperature Ranges	- Operating Temperature - Approved Ambient Temp. - Case Temperature - Storage Temperature	-40°C to +90°C +50°C max. (to comply with EN 60601-1) +105°C max. -55°C to +125°C
Power Derating	- High Temperature	3.33 %/K above 75°C
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote - Off Idle Input Current - Remote Pin Input Current	On: 0 to 1.2 VDC or open circuit Off: 2.2 to 12 VDC Refers to 'Remote' and '-Vin' Pin 2.5 mA typ. -0.5 to 1.0 mA (Only for optional models with remote-control)
Altitude During Operation		5'000 m max.
Switching Frequency		270 - 330 kHz (PWM) 300 kHz typ. (PWM)
Insulation System		Reinforced Insulation
Isolation Test Voltage	- Input to Output, 60 s	5'000 VAC
Creepage	- Input to Output	8 mm min.
Clearance	- Input to Output	8 mm min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	12 pF typ. 17 pF max.
Leakage Current	- Touch Current	2 µA max. (240 VAC, 60 Hz)
Reliability	- Calculated MTBF	3'850'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration - Thermal Shock	MIL-STD-810F MIL-STD-810F
Housing Material		Non-conductive Plastic (UL94 V-0 rated)
Base Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Copper
Pin Foundation Plating		Nickel (2 - 3 µm)
Pin Surface Plating		Tin (3 - 5 µm), matte
Soldering Profile		265°C / 10 s max.
Connection Type		THD (Through-Hole Device)
Weight		14 g
Thermal Impedance		18 K/W
Environmental Compliance	- Reach - RoHS	www.tracopower.com/info/reach-declaration.pdf www.tracopower.com/info/rohs-declaration.pdf

Supporting Documents

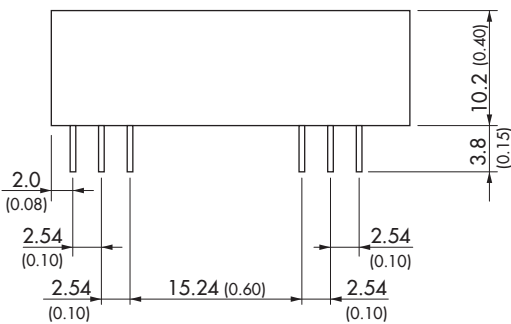
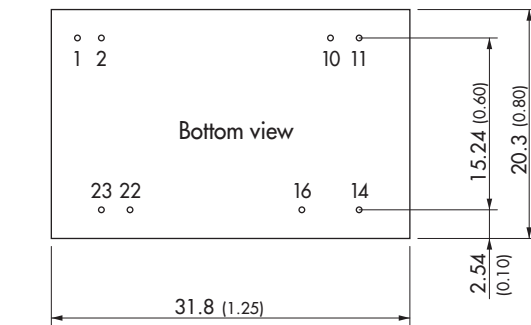
Overview Link (for additional Documents)

www.tracopower.com/overview/thm10wi

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

Outline Dimensions

Standard pinning with options: With adjustable output and/or remote-control function



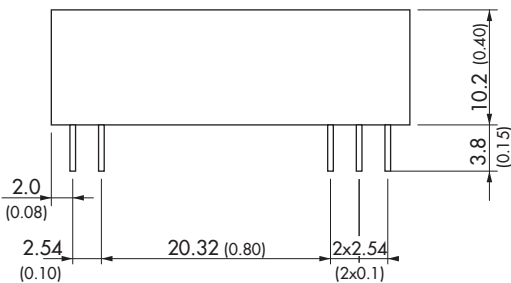
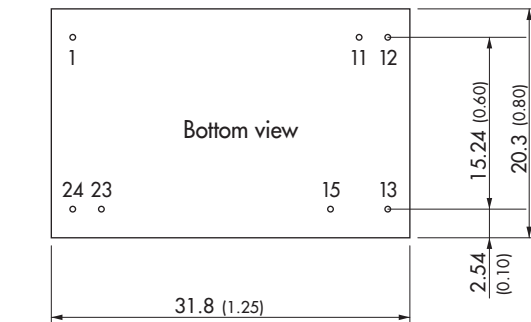
Dimensions in mm (inch)
 Tolerances ± 0.5 (± 0.02)
 Pin $\varnothing 0.6 \pm 0.1$ (0.024 ± 0.004)
 Pin pitch tolerances ± 0.25 (± 0.01)

Pinout		
Pin	Single Output	Dual Output
1	No pin*/Remote	No pin*/Remote
2	-Vin (GND)	-Vin (GND)
10	No pin*/Trim	No pin*/Trim
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

NC: No connection

*If Remote or Trim is not selected there is no pin on corresponding number.

Optional pinning



Dimensions in mm (inch)
 Tolerances ± 0.5 (± 0.02)
 Pin $\varnothing 0.6 \pm 0.1$ (0.024 ± 0.004)
 Pin pitch tolerances ± 0.25 (± 0.01)

Pinout		
Pin	Single Output	Dual Output
1	+Vin (Vcc)	+Vin (Vcc)
11	No pin	Common
12	-Vout	No pin
13	+Vout	-Vout
15	No pin	+Vout
23	-Vin (GND)	-Vin (GND)
24	-Vin (GND)	-Vin (GND)

Remark:

No optional pinning for 5 Vin models. Corresponding parts are with THM 10 series by default.

see www.tracopower.com/overview/thm10



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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