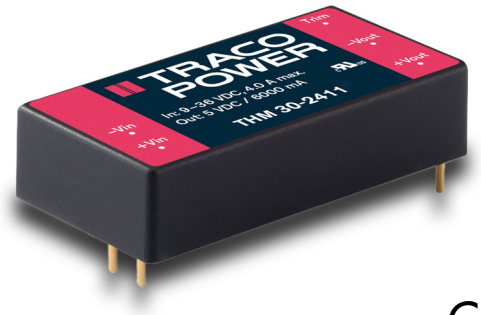
TRACO POWER

DC/DC Converter

THM 30WI Series, 30 Watt

- **Ultra wide 4:1 input voltage 30 W DC/DC converter in a 2 × 1 ” plastic case**
- **I/O isolation 5000 VACrms rated for 250 VACrms working voltage**
- **Certification according to IEC/EN/ES 60601-1 3rd edition for 2×MOPP**
- **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 80°C.**
- **EMC compliance to IEC 60601-1-2 4th edition and EN55032 class A**
- **Operating up to 5000m altitude**
- **5 year product warranty**



CB Scheme IEC 60601-1

cULus ES 60601-1

The THM 30WI series is a range of medical 30 Watt DC/DC converters in 2.0” 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 +80°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 30-2411WI	9.0 – 36 VDC (24 VDC nominal)	5.0 VDC	6000 mA	88.5 %
THM 30-2412WI		12 VDC	2500 mA	89.0 %
THM 30-2413WI		15 VDC	2000 mA	90.5 %
THM 30-2415WI		24 VDC	1250 mA	89.5 %
THM 30-2421WI		±5 VDC	±3000 mA	86.0 %
THM 30-2422WI		±12 VDC	±1250 mA	89.5 %
THM 30-2423WI		±15 VDC	±1000 mA	90.0 %
THM 30-4811WI	18 – 75 VDC (48 VDC nominal)	5.0 VDC	6000 mA	89.0 %
THM 30-4812WI		12 VDC	2500 mA	89.0 %
THM 30-4813WI		15 VDC	2000 mA	90.0 %
THM 30-4815WI		24 VDC	1250 mA	89.0 %
THM 30-4821WI		±5 VDC	±3000 mA	86.5 %
THM 30-4822WI		±12 VDC	±1250 mA	90.0 %
THM 30-4823WI		±15 VDC	±1000 mA	89.5 %

* suffix **-A1** for remote control option with positive logic
suffix **-A2** for remote control option with negative logic

Input Specifications

Input current no load		24 Vin models: 48 Vin models:	10 mA typ. 9 mA typ.
Surge voltage (3 s max.)		24 Vin models: 48 Vin models:	50 V max. 100 V max.
Start-up voltage		24 Vin models: 48 Vin models:	9 VDC (or lower) 18 VDC (or lower)
Startup time			60 ms max. (30 ms typ.)
Under voltage shut down (lock-out circuit)		24 Vin models: 48 Vin models:	7.8 - 8.6 VDC 15.8 - 17.4 VDC
Input filter			Pi-type
EMI emission	– Conducted & Radiated input suppression		EN 55011 limits to IEC 60601-1-2 4th editon EN55032 class A (internal filter) EN55032 class B with external components
	– Filter proposal		www.tracopower.com/overview/thm30wi
EMC immunity	– Generic for Medical equipment		IEC/EN 60601-1-2 4th edition
	– ESD (electrostatic discharge)		EN 61000-4-2, air ±15 kV, contact ±8 kV, perf. criteria A
	– Radiated immunity		EN 61000-4-3, 10 V/m, perf. criteria A
	– Fast transient / surge		EN 61000-4-4, ±2 kV, perf. criteria A
	(with external input capacitor / diode)		EN 61000-4-5, ±2 kV perf. criteria A
		24 Vin models:	2 pcs. Nippon chemi-con KY 220 µF / 100 V 1 pcs. TVS - SMDJ58A, 58V, 3000 W)
		48 Vin models:	2 pcs. Nippon chemi-con KY 220 µF / 100 V 1 pcs. TVS - SMDJ120A, 120V, 3000 W)
	– Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A
	– Magnetic field immunity		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: 48 Vin models:	6.3 A 3.15 A

Output Specifications

Voltage set accuracy			±1 % max.
Output voltage adjustment range (single output modesl only)		5 & 12 VDC models: 15 & 24 VDC models:	±10 % –10 / +20 %
Regulation	– Input variation	single output: dual output:	0.2 % max. 0.5 % max.
	– Load variation 0 – 100 %	single output: dual output:	0.2 % max. 1.0 % max.
	– Cross regulation	dual output:	5.0 % max. (asymmetrical load 25/100 %)
Temperature coefficient			±0.02 %/K max.
Minimum load			not required
Ripple and noise (20 MHz Bandwidth)		(±)5.0 VDC models: (±)12 VDC models: ±15 VDC models: 15 VDC models: 24 VDC models:	50 mVp-p typ. with cap. 10 µF/25 V X7R MLCC 75 mVp-p typ. with cap. 10 µF/25 V X7R MLCC 75 mVp-p typ. with cap. 10 µF/25 V X7R MLCC 100 mVp-p typ. with cap. 10 µF/25 V X7R MLCC 100 mVp-p typ. with cap. 4.7 µF/50 V X7R MLCC
Transient response	– Recovery time (25% load step change)		250 µs typ.
Over current limitation			at 150 % typ. of Iout rated (hiccup mode) at 185 % max. of Iout rated (hiccup mode)
Short-circuit protection			Continuous, automatic recovery

Output Specifications (continued)

Overvoltage protection		(±)5.0 VDC models:	6.2 VDC typ.
		(±)12 VDC models:	15 VDC typ.
		(±)15 VDC models:	20 VDC typ.
		24 VDC models:	30 VDC typ.
Capacitive load	–Single output	5.0 VDC models:	7'200 µF max.
		12 VDC models:	1'200 µF max.
		15 VDC models:	1'000 µF max.
		24 VDC models:	375 µF max.
	–Dual output	±5 VDC models:	3'600 µF max. (each output)
		±12 VDC models:	750 µF max. (each output)
		±15 VDC models:	500 µF max. (each output)

General Specifications

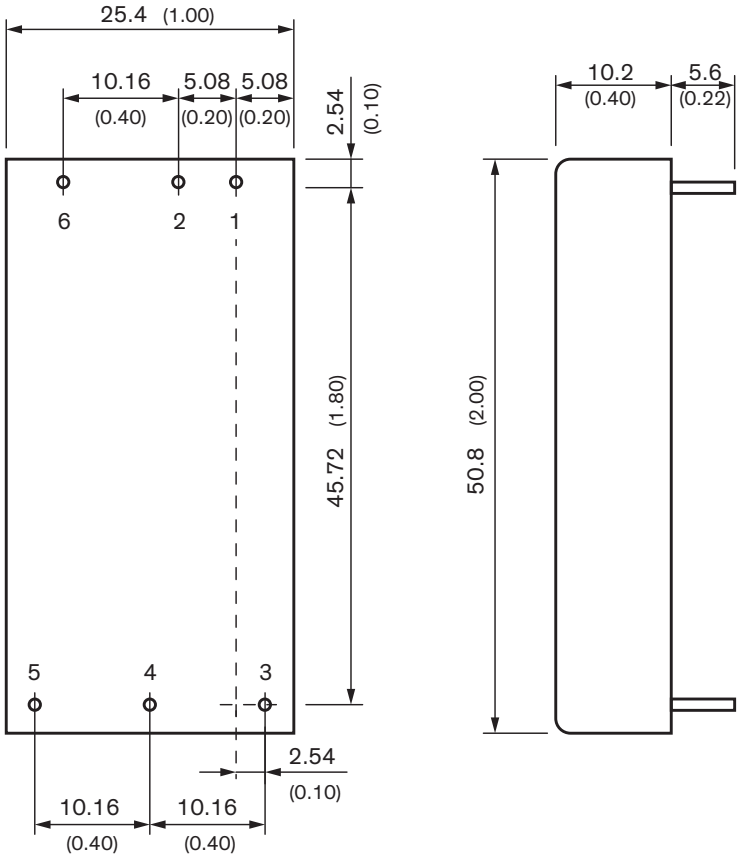
Temperature ranges	– Operating		–40°C to +80°C
	– Case temperature		+105°C max.
	– Storage temperature		–55°C to +125°C
Derating		(±)5 VDC models:	1.67 %/K above 45°C
		other models:	2 %/K above 55°C
Overtemperature protection			at 115°C typ.
Thermal impedance			12.9 K/W typ.
Humidity (non condensing)			5 % to 95 % rel H max.
Isolation voltage (50 Hz, 60 s)			5000 VACrms reinforced
Clearance/creepage			8 mm min.
Leakage current (at 240 VAC, 60 Hz)			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)			1'137'000 h
Switching frequency			225 – 285 kHz typ. (pulse width modulation)
Vibration and thermal shock resistance			according to MIL-STD-810F
Remote On/Off (for THM 30WI -A1 / -A2 option models only)			
	– Positive logic (-A1 models)	Off:	short circuit or 0 – 1.2 VDC (referred to -Vin pin)
		On:	open circuit or 3.5 – 12 VDC (referred to -Vin pin)
	– Negative logic (-A2 models)	Off:	open circuit or 3.5 – 12 VDC (referred to -Vin pin)
		On:	short circuit or 0 – 1.2 VDC (referred to -Vin pin)
	– Off idle current		2.5 mA typ.
	– Remote pin input current		–0.5 mA min.
			1 mA max.
Safety standards/approvals	– Medical equipment		ANSI/AAMI ES 60601-1:2005/(R)2012, IEC/EN 60601-1 3rd edition
	– Certification documents		www.tracopower.com/overview/thm30wi
Environmental compliance	– Reach		www.tracopower.com/info/reach-declaration.pdf
	– RoHS		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	32 g (1.13 oz)
Soldering temperature	max. 265°C / 10 s

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)
3	+Vout	+Vout
4	–Vout	Common
5	Trim	–Vout
6	No pin* / Remote	No pin* / Remote

*If remote is not selected ther will be no pin

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

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