DC/DC Converters

THN 30WI Series, 30 Watt

Features

- Highest power density 30W converter! Ultra compact size: 1.0" x 1.0" x 0.4"
- Shielded metal case with isolated baseplate
- Ultrawide 4:1 input voltage range
- Very high efficiency across full load range up to 92%
- No minimum load required
- Remote On/Off control
- Operating temp. range –40°C to +80°C and up to 85 °C with heat-sink
- Over temperature protection
- Output voltage adjustable
- I/O isolation voltage 1500 VDC
- RoHS 2011/65/EU compliant
- 3-year product warranty

CB Scheme UL 60950-1

cULus UL 60950-1

The THN 30WI series is the latest generation of high performance DC/DC converter modules with highest power density. The product achieves 30W output power while it comes in a metal case with dimensions of only 1.0"x 1.0"x 0.4".
All models have an ultra wide 4:1 input voltage range and precisely regulated output voltages, even under no load conditions. Highest efficiency across full load range makes this product very reliable and applicable in temperature ranges of up to 85°C. With a low input current at minimal load and remote On/Off control these converters are the ideal solution for battery-operated systems. Typical applications are in mobile equipments, instrumentation, distributed power architectures in communication and industrial electronics and everywhere where space on the PCB is critical.

Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
THN 30-2410WI	**9 – 36 VDC** (24 VDC nominal)	3.3 VDC	7000 mA	86 %
THN 30-2411WI		5.0 VDC	6000 mA	89 %
THN 30-2411WI-A1		5.0 VDC *1	6000 mA	89 %
THN 30-2412WI		12 VDC	2500 mA	89 %
THN 30-2413WI		15 VDC	2000 mA	89 %
THN 30-2415WI		24 VDC	1250 mA	89 %
THN 30-2425WI *2		48 VDC	625 mA	91 %
THN 30-2422WI		±12 VDC	±1250 mA	89 %
THN 30-2423WI		±15 VDC	±1000 mA	91 %
THN 30-2425WI		±24 VDC	±625 mA	91 %
THN 30-4810WI	**18 – 75 VDC** (48 VDC nominal)	3.3 VDC	7000 mA	87 %
THN 30-4811WI		5.0 VDC	6000 mA	90 %
THN 30-4811WI-A1		5.0 VDC *1	6000 mA	90 %
THN 30-4812WI		12 VDC	2500 mA	90 %
THN 30-4813WI		15 VDC	2000 mA	91 %
THN 30-4815WI		24 VDC	1250 mA	91 %
THN 30-4825WI *2		48 VDC	625 mA	91 %
THN 30-4822WI		±12 VDC	±1250 mA	91 %
THN 30-4823WI		±15 VDC	±1000 mA	92 %
THN 30-4825WI		±24 VDC	±625 mA	92 %

*1 Adjustable output up to 6 VDC

*2 This dual ±24 VDC converter can be used as single 48 VDC converter (open common contact)

Input Specifications

Input current at no load (at nominal input voltage)	24 Vin models: 48 Vin models:	10 mA typ. 8 mA typ.
Start-up voltage	24 Vin models: 48 Vin models:	< 9.0 VDC < 18 VDC
Under voltage shut down (lock-out circuit)	24 Vin models: 48 Vin models:	8.0 VDC typ. 16 VDC typ.
Surge voltage (1 sec. max.)	24 Vin models: 48 Vin models:	50 V max. 100 V max.
Reflected input ripple current		30 mAp-p typ.
Conducted noise (input) – Filter proposal for compling to class A/B		EN 55032 class A and B (with external components) www.tracopower.com/overview/thn30wi
ESD (electrostatic discharge)		EN 61000-4-2, air ±8 kV, contact ±6 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 EN 61000-4-5, ±2 kV perf. criteria A With external input capacitor e.g. Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm
Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A
Recommended input fuse (slow blow)	24 Vin models: 48 Vin models:	6300 mA 3150 mA

Output Specifications

Voltage set accuracy		±1 %
Output voltage adjustment range	5.0 Vout A1 models: 15 & 24 Vout models: other single output models: – For further information see application note	–10 % to +20% –10 % to +20% ±10 % www.tracopower.com/overview/thn30wi
Regulation	– Input variation (Vmin – Vmax) single output models: dual output models: – Load variation (0 – 100 %) single output models: dual output models balanced load: dual output models unbalanced load (25% /100%):	0.2 % max. 0.5 % max. 0.2 % max. 1.0 % max. 5.0 % max.
Minimum load		not required
Ripple and noise (measured with output capacitor) (20 MHz bandwidth)	3.3 & 5.0 Vout models: 12 & 15 Vout models: 24 Vout models: dual output models:	75 mVp-p with (22µF/25V X7R 1812 MLCC) 75 mVp-p with (2x 22µF/25V X7R 1812 MLCC) 75 mVp-p with (2x 6.8µF/50V X7R 1812 MLCC) 60 mVp-p with (10µF/50V X7R 1812 MLCC)
Temperature coefficient		±0.02 %/K
Output current limitation		at 170 % of Iout max.
Short circuit protection		hiccup, automatic recovery
Over voltage protection	3.3 Vout models: 5.0 Vout models: 5.0 Vout A1 models: 12 Vout models: 15 Vout models: 24 Vout models:	3.7 – 5.4 VDC 5.6 – 7.0 VDC 6.3 – 7.4 VDC 13.5 – 19.6 VDC 18.3 – 22.0 VDC 29.1 – 32.5 VDC
Start up time (nominal Vin and constant resistive load)		30 ms max. (for power on and remote on)
Transient response setting time		250 µs typ. (25% load step change)

Output Specifications (continued)

Max. capacitive load	3.3 Vout models:	10'000 µF
	5 Vout models:	7'200 µF
	12 Vout models:	1'200 µF
	15 Vout models:	1'000 µF
	24 Vout models:	375 µF
	±12 Vout models:	750 µF (each output)
	±15 Vout models:	500 µF (each output)
	±24 Vout models:	180 µF (each output)

General Specifications

Temperature ranges	– Operating without heat sink	–40°C to +80°C (with derating)
	– Operating with heat sink	–40°C to +85°C (with derating)
	– Case temperature	+105°C max.
	– Storage	–55°C to +125°C
Power derating	– Operating without heat sink	2.2 %/K above +55°C
	– Operating with heat sink	2.5 %/K above +60°C
Thermal impedance	– Natural convection	15.0°C/W
	– Natural convection with heat sink	13.8°C/W
Thermal protection		shutdown at 115°C
Humidity (non condensing)		5 % to 95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +70°C, ground benign)		1.2 Mio. h
Isolation voltage (60sec.)	– Input/Output	1'500 VDC
	– Input, Output/Case	1'000 VDC
Isolation capacitance	– Input/Output	1'500 pF max.
Isolation resistance	– Input/Output (500 VDC)	>1 GOhm
Remote On/Off	– On:	3.0 to 15 VDC or open circuit
	– Off:	0 to 1.2 VDC or short circuit pin 6 and pin 2
	– Off idle current:	2.0 mA
Switching frequency (fixed, pulse width modulation)	3.3 & 5.0 Vout models:	275 kHz ±10%
	other models:	330 kHz ±10%
Vibration and thermal shock		MIL-STD-810F
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals	– Online certification for UL/cUL 60950-1	www.ul.com -> certifications -> File e188913 copy: QQGQ2 (USA) QQGQ8 (Canada)
	– Certification documents	www.tracopower.com/overview/thn30wi

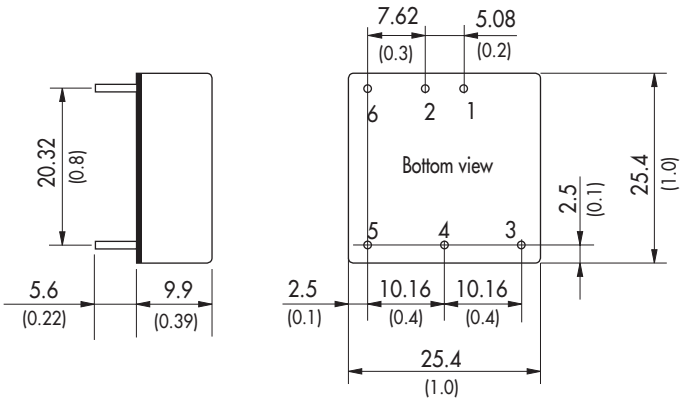
Physical Specifications

Casing material		copper
Baseplate		non conductive FR4
Potting material		silicone (UL 94V-0 rated)
Weight		16.5 g (0.58oz)
Soldering temperature		max. 265°C / 10sec.
Environmental compliance	– Reach	www.tracopower.com/info/reach-declaration.pdf
	– RoHS	RoHS directive 2011/65/EU

Application note: www.tracopower.com/overview/thn30wi

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

Outline Dimensions

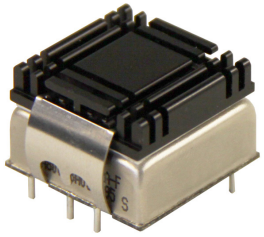


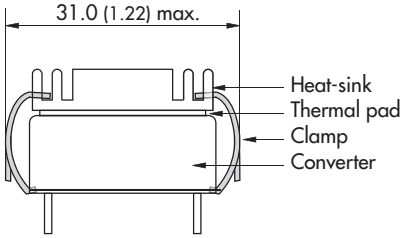
Pin-Out		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	+Vin (Vcc)
2	–Vin (GND)	–Vin (GND)
3	+Vout	+Vout
4	Trim	Common
5	–Vout	–Vout
6	Remote On/Off	

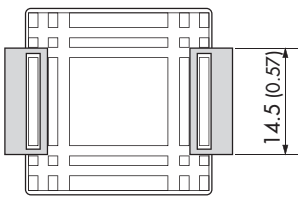
Dimensions in [mm], () = Inch
Pin diameter ⌀ 1.0 (0.04)
Pin pitch tolerances: ±0.25 (±0.01)
Tolerances: ±0.5 (±0.02)

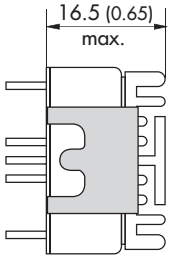
Heat-Sink (Option)

Order code: **THN-HS1**
(cont.: heat-sink, thermal pad, 2 clamps)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 8 g (0.28oz) without converter
Thermal impedance after assembling: 13.8 K/W









Note:
The product label on converter has to be removed before mounting the heat-sink.
For volume orders converters will be supplied with heat-sink already mounted. Please contact factory for quotation.
Separate heat-sinks are only available for prototypes and small quantity orders.