DC/DC Converters

THN 15WI Series, 15 Watt

CB Scheme UL 60950-1 cULus UL 60950-1

Features

- Smallest encapsulated 15W Converter! Ultra compact size: 1.0" x 1.0" x 0.4"
- Shielded metal case with isolated baseplate
- Ultrawide 4:1 input ranges 9-36 VDC or 18-75VDC
- Output voltage Trim
- I/O isolation voltage 1500 VDC
- Very high efficiency up to 87%
- Operating temp. range : –40°C to +85°C
- Remote On/Off control
- Industry standard pinout
- 3-year product warranty

The THN-15WI series is the latest generation of high performance dc-dc converter modules setting new standards concerning power density. This product with 15W comes in a encapsulated, shielded metal package with dimensions of only 1.0"x 1.0"x 0.4" and occupies 50% (!) less board space.
All models have ultra wide 4:1 input voltage range and precisely regulated output voltages. Advanced circuit design provides high efficiency up to 87% which allows a operating temperature range of –40°C to +85°C (with derating) Further features include remote On/Off and trimmable output. Typical applications for these converters are battery operated equipment, mobile instrumentation, distributed power architectures in communication and industrial electronics and everywhere where space on PCB is critical.

Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
THN 15-2410WI	**9 – 36 VDC** (24 VDC nominal)	3.3 VDC	4'000 mA	86 %
THN 15-2411WI		5.0 VDC	3'000 mA	86 %
THN 15-2411WI-A1		5.0 VDC *1	3'000 mA	86 %
THN 15-2412WI		12 VDC	1'300 mA	87 %
THN 15-2413WI		15 VDC	1'000 mA	87 %
THN 15-2415WI		24 VDC	625 mA	90 %
THN 15-2421WI		±5 VDC	±1'500 mA	85 %
THN 15-2422WI		±12 VDC	±625 mA	87 %
THN 15-2423WI		±15 VDC	±500 mA	88 %
THN 15-2425WI		±24 VDC (48 VDC) *2	±315 mA	91 %
THN 15-4810WI	**18 – 75 VDC** (48 VDC nominal)	3.3 VDC	4'000 mA	86 %
THN 15-4811WI		5.0 VDC	3'000 mA	87 %
THN 15-4811WI-A1		5.0 VDC *1	3'000 mA	87 %
THN 15-4812WI		12 VDC	1'300 mA	87 %
THN 15-4813WI		15 VDC	1'000 mA	87 %
THN 15-4815WI		24 VDC	625 mA	91 %
THN 15-4821WI		±5 VDC	±1'500 mA	85 %
THN 15-4822WI		±12 VDC	±625 mA	86 %
THN 15-4823WI		±15 VDC	±500 mA	87 %
THN 15-4825WI		±24 VDC (48 VDC) *2	±315 mA	90 %

*1 Adjustable output up to 6 VDC

*2 The outputs can also be used in serial circuit for single 48 VDC operation.

Input Specifications

Input current at no load	– 24 Vin	3.3 Vout models:	45 mA typ.
		5 Vout models:	70 mA typ.
		24 Vout models:	12 mA typ.
		±24 Vout models:	15 mA typ.
		other models:	20 mA typ.
	– 48 Vin	3.3 Vout models:	25 mA typ.
		5 Vout models:	35 mA typ.
		12, 15 & ±5 Vout models:	12 mA typ.
		±12 Vout models:	15 mA typ.
		±15 Vout models:	20 mA typ
		24 & ±24 Vout models:	10 mA typ
Start-up voltage / under voltage shut down		24 Vin models:	9 VDC / 8 VDC
		48 Vin models:	18 VDC / 16 VDC
Surge voltage (100 ms max.)		24 Vin models:	50 V max.
		48 Vin models:	100 V max.
Reflected input ripple current			30 mA typ.
Conducted noise			EN 55032 class A and B (with external components)
	– Filter proposal for compling to class A/B		www.tracopower.com/overview/thn15wi
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 (with external input capacitor)			EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±1 kV perf. criteria A
	– External input capacitor		Nippon chemi-con KY 220 µF, 100 V
Conducted immunity			EN 61000-4-6, 3 Vrms, perf. criteria A

Output Specifications

Voltage set accuracy			±1 %
Output voltage adjustment range		5.0 Vout A1 models:	–10 to +20 %
		24 Vout models:	–10 to +20 %
		all other models:	±10 % only for single output models
	– For further information see application note		www.tracopower.com/overview/thn15wi
Regulation	– Input variation (Vmin – Vmax)	single output models:	0.2 % max.
		dual output models:	0.5 % max.
	– Load variation (0 – 100 %)	single output models:	0.2 % max.
		dual output models balanced load:	1.0 % max.
		dual output models unbalanced load (25% /100%):	5.0 % max.
Minimum load			not required
Ripple and noise (20 MHz bandwidth)		3.3/5.0 Vout models:	75 mVpk-pk with external capacitor
		all other models:	100 mVpk-pk max. with external capacitor
	– For further information see application note		www.tracopower.com/overview/thn15wi
Temperature coefficient			±0.02 %/K
Output current limitation			typ. 150 % of Iout max., Hiccup
Short circuit protection			continuous, automatic recovery
Over voltage protection		3.3 Vout models:	3.7 – 5.4 VDC
		5 Vout models:	5.6 – 7.0 VDC
		5 Vout A1 models	6.3 – 7.4 VDC
		12 Vout models:	13.5 – 19.6 VDC
		15 Vout models:	16.8 – 20.5 VDC
		24 Vout models:	29.1 – 32.5 VDC

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

Output Specifications (continued)

Start up time (nominal Vin and constant resistive load)		30 ms typ. (for power on and remote on)
Transient response setting time (25% load step change)		250 µs typ.
Max. capacitive load	3.3 Vout models:	12'000 µF
	5 Vout models:	6'000 µF
	12 Vout models:	1'000 µF
	15 Vout models:	660 µF
	24 Vout models:	200 µF
	±5 Vout models:	3'000 µF (each output)
	±12 Vout models:	520 µF (each output)
	±15 Vout models:	330 µF (output)
	±24 Vout models:	100 µF (both output)

General Specifications

Temperature ranges	– Operating	–40°C to +85°C (with derating)
	– Casing	+105°C max.
	– Storage	–55°C to +125°C
Power derating		2.2 %/K above 60°C
Thermal impedance	– Natural convection	18.2°C/W
	– Natural convection with heat-sink	15.8°C/W
Humidity (non condensing)		5 % to 95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>1.4 Mio. h
Isolation voltage (60 s)	– Input/Output	1'600 VDC
Isolation capacitance	– Input/Output	1000 pF typ.
Isolation resistance	– Input/Output (500 VDC)	>1'000 MOhm
Remote On/Off	– On:	3.0 ... 15 VDC or open circuit
	– Off:	0 ... 1.2 VDC or short circuit pin 6 and pin 2
	– Off idle current:	2.5 mA
Switching frequency (fixed)		400 kHz typ. (pulse width modulation PWM)
Vibration and thermal shock		MIL-STD-810F
Safety standards		UL/cUL 60950-1, EN 60950-1, IEC 60950-1
	– Certification documents	www.tracopower.com/overview/thn15wi
Environmental compliance	– Reach	www.tracopower.com/overview/thn15wi
	– RoHS	RoHS directive 2011/65/EU

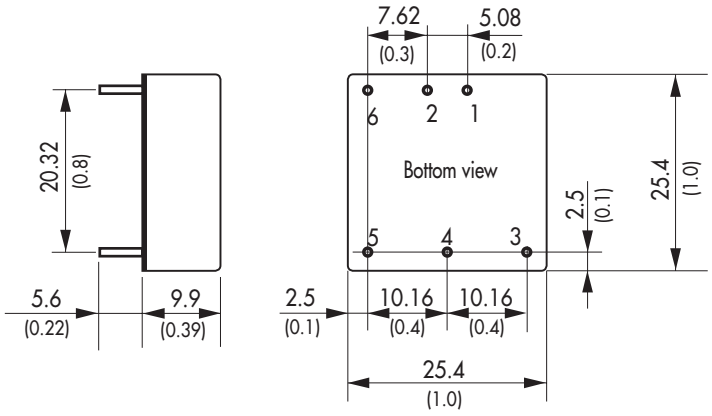
Physical Specifications

Casing material	nickel coated copper
Baseplate	non conductive FR4
Potting material	epoxy (UL 94V-0 rated)
Weight	15 g (0.53oz)
Soldering temperature	265°C / 10 s max.

Application note: www.tracopower.com/overview/thn15wi

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

Outline Dimensions mm (inches)



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	

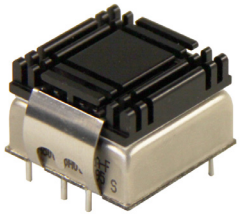
*Optional versions:

- without remote and trim pins add suffix **-B** (e.g.THN 15-2412WI-B)
- without remote pin add suffix **-B1** (e.g. THN 15-2413WI-B1)
- without trim pin add suffix **-B2** (e.g. THN 15-4811WI-B2)

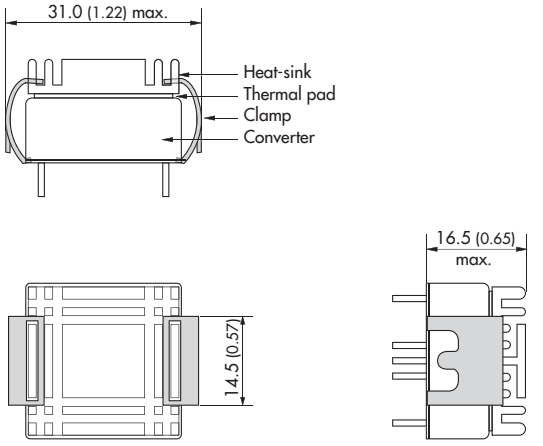
Dimensions in [mm], () = Inch
Pin diameter ø 1.0 (0.04)
Pin pitch tolerances: ±0.25 (±0.01)
Tolerances: ±0.5 (±0.02)

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: 15.8 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.



Dimensions in mm, () = Inch