

Features

- ◆ Smallest encapsulated 15W Converter!
Ultra compact size: 1.0" x 1.0" x 0.4"
- ◆ Shielded metal case with isolated baseplate
- ◆ Wide 2:1 input ranges
- ◆ Output voltage Trim
- ◆ I/O isolation voltage 1500 VDC
- ◆ Very high efficiency up to 88%
- ◆ Operating temp. range :
-40°C to +85°C
- ◆ Remote On/Off control
- ◆ Industry standard pinout
- ◆ 3-year product warranty



The THN-15 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"x1.0"x 0.4" and occupies 50%(!) less board space. All models have wide 2:1 input voltage range and precisely regulated, isolated output voltages. Advanced circuit design provides high efficiency up to 88% 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 mobile equipment, 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 15-1210	9 – 18 VDC (12 VDC nominal)	3.3 VDC	4'000 mA	84 %
THN 15-1211		5.0 VDC	3'000 mA	88 %
THN 15-1212		12 VDC	1'300 mA	86 %
THN 15-1213		15 VDC	1'000 mA	88 %
THN 15-1215		24 VDC	625 mA	90 %
THN 15-1221		±5 VDC	±1'500 mA	85 %
THN 15-1222		±12 VDC	±625 mA	87 %
THN 15-1223		±15 VDC	±500 mA	88 %
THN 15-1225		±24 VDC (48 VDC)*	±315 mA	90 %
THN 15-2410		18 – 36 VDC (24 VDC nominal)	3.3 VDC	4'000 mA
THN 15-2411	5.0 VDC		3'000 mA	88 %
THN 15-2412	12 VDC		1'300 mA	87 %
THN 15-2413	15 VDC		1'000 mA	88 %
THN 15-2415	24 VDC		625 mA	90 %
THN 15-2421	±5 VDC		±1'500 mA	85 %
THN 15-2422	±12 VDC		±625 mA	88 %
THN 15-2423	±15 VDC		±500 mA	88 %
THN 15-2425	±24 VDC (48 VDC)*		±315 mA	90 %
THN 15-4810	36 – 75 VDC (48 VDC nominal)		3.3 VDC	4'000 mA
THN 15-4811		5.0 VDC	3'000 mA	88 %
THN 15-4812		12 VDC	1'300 mA	88 %
THN 15-4813		15 VDC	1'000 mA	88 %
THN 15-4815		24 VDC	625 mA	91 %
THN 15-4821		±5 VDC	±1'500 mA	85 %
THN 15-4822		±12 VDC	±625 mA	89 %
THN 15-4823		±15 VDC	±500 mA	88 %
THN 15-4825		±24 VDC (48 VDC)*	±315 mA	90 %

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

Input Specifications

Input current at no load	- 12 Vin	3.3 / 5 VDC models: 120 mA typ. / 90 mA typ. 24 / ±24 VDC models: 12 mA typ. / 17 mA typ. other models: 30 mA typ.
	- 24 Vin	3.3 / 5 VDC models: 50 mA typ. / 65 mA typ. 12 & 15 VDC models: 20 mA typ. ±5 & ±12 VDC models: 15 mA typ.
	- 48 Vin	24 / ±24 VDC models: 10 mA typ. / 12 mA typ. 3.3 / 5 VDC models: 25 mA typ. / 35 mA typ. 12, 15 & ±5 VDC models: 12 mA typ. ±12 VDC models: 15 mA typ. ±15 VDC models: 20 mA typ. 24 & ±24 VDC models: 10 mA typ.
Start-up voltage / under voltage shut down		12 Vin models: 9.0 VDC / 8.0 VDC 24 Vin models: 18.0 VDC / 14.5 VDC 48 Vin models: 36.0 VDC / 30.5 VDC
Surge voltage (100 msec. max.)		12 Vin models: 36 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max.
Reflected input ripple current		30 mA typ.
Conducted noise		EN 55022 class A and B with external components
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 Nippon chemi-con KY 220 µF, 100 V
	- external input capacitor	
Conducted immunity		EN 61000-4-6, 3 Vrms, perf. criteria A

Output Specifications

Voltage set accuracy		±1 %
Output voltage adjustment range		24 Vin models: -10 / +20 % all other models: ±10 % only for single output models see application note.
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 VDC models: 75 mVpk-pk with external capacitor all other models: 100 mVpk-pk max. with external capacitor see application note
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 Vout 5 Vout models: 5.6 - 7.0 Vout 12 Vout models: 13.5 - 19.6 Vout 15 Vout models: 16.8 - 20.5 Vout 24 Vout models: 29.1 - 32.5 Vout
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 chang)		250 µs typ.

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

Output Specifications

Max. capacitive load	3.3 VDC models:	12'000 μ F
	5 VDC models:	6'000 μ F
	12 VDC models:	1'000 μ F
	15 VDC models:	660 μ F
	24 VDC models:	200 μ F
	\pm 5 VDC models:	\pm 3'000 μ F
	\pm 12 VDC models:	\pm 520 μ F
	\pm 15 VDC models:	\pm 330 μ F
\pm 24 VDC models:	\pm 100 μ F	

General Specifications

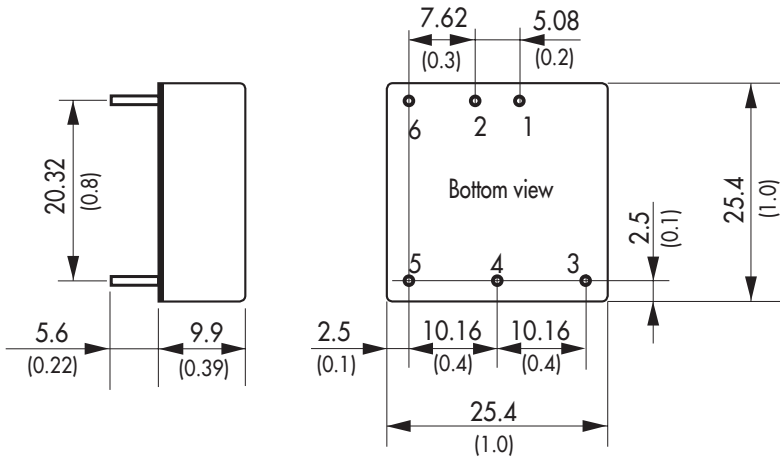
Temperature ranges	<ul style="list-style-type: none"> - Operating - Case temperature - Storage 	-40°C to +85°C (with derating) +105°C max. -55°C to +125°C
Power derating		2.8 %/K above 70°C
Thermal impedance	<ul style="list-style-type: none"> - Natural convection - Natural convection with heat-sink 	18.2°C/W 15.8°C/W
Humidity (non condensing)		5 % to 95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>1.6 Mio. h
Isolation voltage (60 sec.)	- Input/Output	1'500 VDC
Isolation capacitance	- Input/Output	1000 pF typ.
Isolation resistance	- Input/Output (500 VDC)	>1'000 MOhm
Remote On/Off	<ul style="list-style-type: none"> - On: - Off: - Off idle current: 	3.0 ... 15 VDC or open circuit 0 ... 1.2 VDC or short circuit pin 6 and pin 2 2.5 mA
Switching frequency (fixed)		400 kHz typ. (pulse width modulation PWM)
Thermal shock, mechanical shock & vibration	- Test conditions	EN 61373, MIL-STD-810F www.tracopower.com/products/mil810.pdf
Safety standards	- Certification documents	UL /cUL 60950-1, EN 60950-1, IEC 60950-1 www.tracopower.com/overview/thn15
Environmental compliance	<ul style="list-style-type: none"> - Reach - RoHS 	www.tracopower.com/overview/thn15 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	max. 265°C / 10sec.

Application note: www.tracopower.com/products/thn15-application.pdf

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 \varnothing 1.0 (0.04)
 Pin pitch tolerances: ± 0.25 (± 0.01)
 Tolerances: ± 0.5 (± 0.02)

***Optional versions:**

- without remote and trim pins add suffix **-B** (e.g. THN 15-2412-B)
- without remote pin add suffix **-B1** (e.g. THN 15-1211-B1)
- without trim pin add suffix **-B2** (e.g. THN 15-2413-B2)

Heat-Sink (Option)

Order code: THN-HS1

(cont.: heat-sink, thermal pad, 2 clamps)

Material: Aluminum

Finish: Anodic treatment (black)

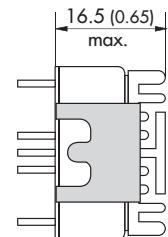
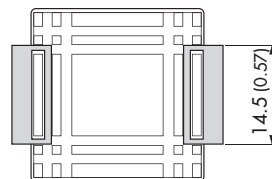
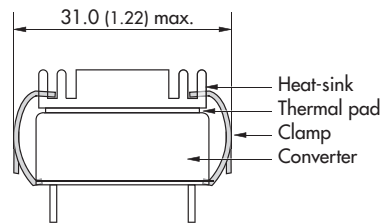
Weight: 8 g (0.28oz) without converter

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

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com