

### 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.
	– 24 Vin	other models:	30 mA typ.
		3.3 / 5 VDC models:	50 mA typ. / 65 mA typ.
– 48 Vin	12 & 15 VDC models:	20 mA typ.	
	±5 & ±12 VDC models:	15 mA typ.	
	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.	
Start-up voltage / under voltage shut down		±15 VDC models:	20 mA typ.
		24 & ±24 VDC models:	10 mA typ.
Surge voltage (100 msec. max.)		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
Reflected input ripple current			30 mA typ.
Conducted noise			EN 55022 class A and B with external components
	– Filter recommendation in application note		<a href="http://www.tracopower.com/overview/thn15">www.tracopower.com/overview/thn15</a>
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
	– External input capacitor		EN 61000-4-5, ±1 kV perf. criteria A 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		24 VDC models:	–10 / +20 %
	– Application note	all other models:	±10 % only for single output models <a href="http://www.tracopower.com/overview/thn15">www.tracopower.com/overview/thn15</a>
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
	– Application note	all other models:	100 mVpk-pk max. with external capacitor <a href="http://www.tracopower.com/overview/thn15">www.tracopower.com/overview/thn15</a>
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 $\mu$ F
	5 VDC models:	6'000 $\mu$ F
	12 VDC models:	1'000 $\mu$ F
	15 VDC models:	660 $\mu$ F
	24 VDC models:	200 $\mu$ F
	$\pm$ 5 VDC models:	3'000 $\mu$ F (each output)
	$\pm$ 12 VDC models:	520 $\mu$ F (each output)
	$\pm$ 15 VDC models:	330 $\mu$ F (each output)
	$\pm$ 24 VDC models:	100 $\mu$ F (each output)

### General Specifications

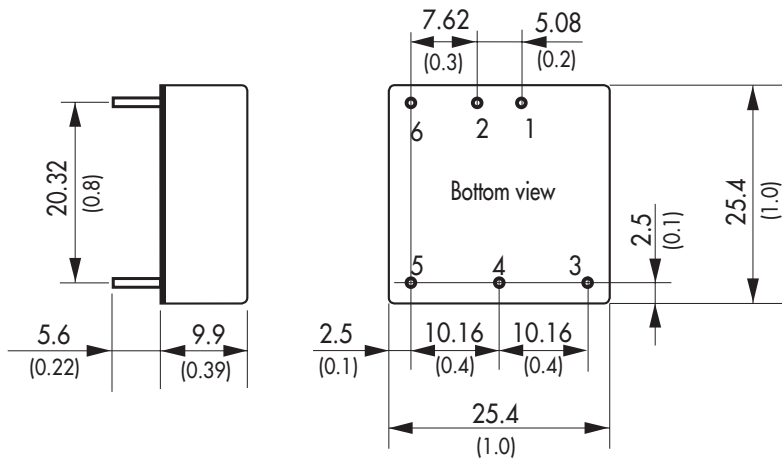
Temperature ranges	<ul style="list-style-type: none"> <li>- Operating</li> <li>- Case temperature</li> <li>- Storage</li> </ul>	-40°C to +85°C (with derating) +105°C max. -55°C to +125°C
Power derating		2.8 %/K above 70°C
Thermal impedance	<ul style="list-style-type: none"> <li>- Natural convection</li> <li>- Natural convection with heat-sink</li> </ul>	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"> <li>- On:</li> <li>- Off:</li> <li>- Off idle current:</li> </ul>	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 <a href="http://www.tracopower.com/products/mil810.pdf">www.tracopower.com/products/mil810.pdf</a>
Safety standards	- Certification documents	UL /cUL 60950-1, EN 60950-1, IEC 60950-1 <a href="http://www.tracopower.com/overview/thn15">www.tracopower.com/overview/thn15</a>
Environmental compliance	<ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>	<a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a> 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/thn15](http://www.tracopower.com/overview/thn15)

**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	

**\*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)

Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing$  1.0 (0.04)  
 Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )  
 Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )

**Heat-Sink (Option)**

**Order code:** THN-HS1

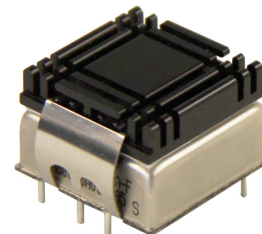
(cont.: heat-sink, thermal pad, 2 clamps)

**Material:** Aluminum

**Finish:** Anodic treatment (black)

**Weight:** 8 g (0.28oz) without converter

Thermal impedance after assembling: 15.8 K/W

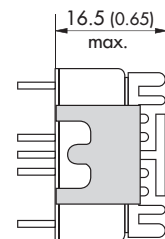
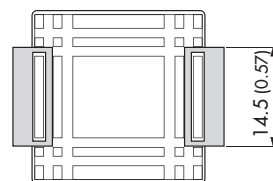
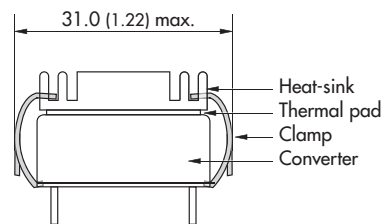


**Note:**

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

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)

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[THN 15-1210](#) [THN 15-1223](#) [THN 15-4810](#) [THN 15-1213](#) [THN 15-4811](#) [THN 15-4823](#) [THN 15-1222](#) [THN 15-4822](#)  
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[THN 15-2415](#) [THN 15-4825](#) [THN 15-4815](#)