

### 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	<b>9 – 18 VDC</b> (12 VDC nominal)	3.3 VDC	4'000 mA	84 %
THN 15-1211		5.0 VDC	3'000 mA	86 %
THN 15-1212		12 VDC	1'300 mA	85 %
THN 15-1213		15 VDC	1'000 mA	87 %
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 15-2410	<b>18 – 36 VDC</b> (24 VDC nominal)	3.3 VDC	4'000 mA	86 %
THN 15-2411		5.0 VDC	3'000 mA	86 %
THN 15-2412		12 VDC	1'300 mA	87 %
THN 15-2413		15 VDC	1'000 mA	88 %
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 15-4810	<b>36 – 75 VDC</b> (48 VDC nominal)	3.3 VDC	4'000 mA	86 %
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 15-4821		±5 VDC	±1'500 mA	85 %
THN 15-4822		±12 VDC	±625 mA	89 %
THN 15-4823		±15 VDC	±500 mA	88 %

### Input Specifications

Input current at no load	12 Vin; 3.3 VDC model:	120 mA typ.
	12 Vin 5 VDC model:	90 mA typ.
	12 Vin other models:	40 mA typ.
	24 Vin; 3.3 VDC model:	50 mA typ.
	24 Vin; 5 VDC model:	65 mA typ.
	24 Vin; other models:	20 mA typ.
48 Vin; 3.3 & 5 VDC models:	40 mA typ.	
	48 Vin; other models:	15 mA typ.
Input current at full load (nominal input)	12 Vin; 3.3 VDC model:	1370 mA typ.
	12 Vin; other models:	1550 mA typ.
	24 Vin; 3.3 VDC model:	670 mA typ.
	24 Vin; other models:	750 mA typ.
	48 Vin; 3.3 VDC model:	330 mA typ.
48 Vin models:	380 mA typ.	
Start-up voltage / under voltage shut down	12 Vin models:	9.0 VDC / 8.0 VDC
	24 Vin models:	17.0 VDC / 14.5 VDC
	48 Vin models:	33.0 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 (input)		EN 55022 level A, FCC part 15, level A with external capacitor <a href="#">see application note.</a>

### Output Specifications

Voltage set accuracy		±1 %	
Output voltage adj. range		±10 % only for single output models. <a href="#">see application note.</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)		100 mVpk-pk max. with external capacitor <a href="#">see application note.</a>	
Temperature coefficient		±0.02 %/K	
Output current limitation		at 150 % of Iout max., foldback	
Short circuit protection		indefinite (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	
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.	
Max. capacitive load	3.3 VDC models:	12'000 µF	
	5 VDC models:	6'000 µF	
	12 VDC models:	1'000 µF	
	15 VDC models:	660 µF	
	±5 VDC models:	±3'000 µF	
	±12 VDC models:	±520 µF	
	±15 VDC models:	±330 µF	

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

### General Specifications

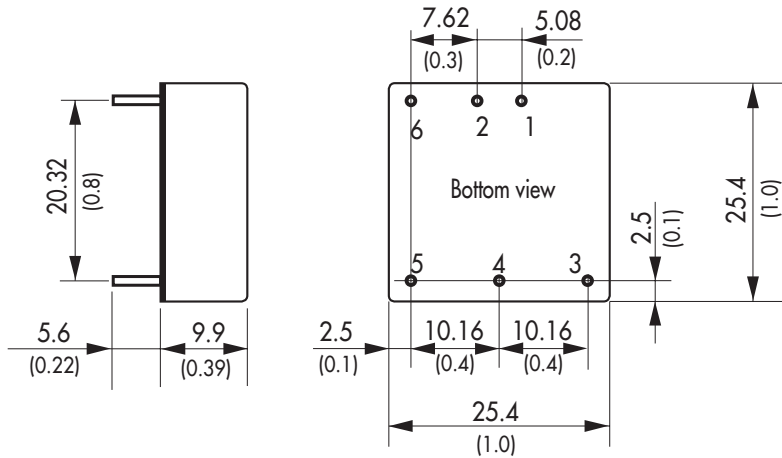
Temperature ranges	<ul style="list-style-type: none"> <li>- Operating</li> <li>- Case temperature</li> <li>- Storage</li> </ul>	-40°C to +85°C (with derating) +105°C max. -55°C to +125°C
Power derating		2.8 %/K above 70°C
Thermal impedance	<ul style="list-style-type: none"> <li>- Natural convection</li> <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)		>560'000 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		UL /cUL 60950-1, EN 60950-1, IEC 60950-1
Safety approvals	<ul style="list-style-type: none"> <li>- CB test report (IEC 60950-1)</li> <li>- UL/cUL</li> </ul>	<a href="http://www.tracopower.com/products/thn15-cb.pdf">www.tracopower.com/products/thn15-cb.pdf</a> <a href="http://www.ul.com">www.ul.com</a> -> certifications -> File e188913
Environmental compliance	<ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>	<a href="http://www.tracopower.com/products/thn15-reach.pdf">www.tracopower.com/products/thn15-reach.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 (0.53 oz)
Soldering temperature	max. 265°C / 10sec.

**Application note:** [www.tracopower.com/products/thn15-application.pdf](http://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	

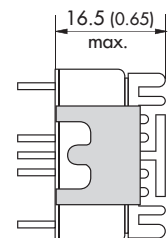
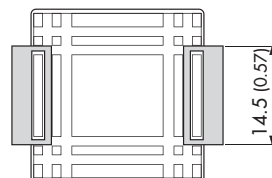
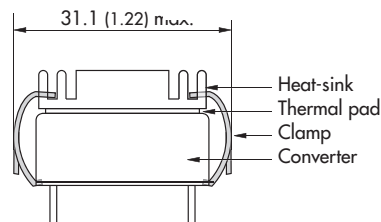
Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing$  1.0 (0.04)  
 Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )  
 Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )

**Heat-Sink (Option)**

**Order code:** THN-HS1  
 (cont.: heat-sink, thermal pad, 2 clamps)  
**Material:** Aluminum  
**Finish:** Anodic treatment (black)  
**Weight:** 8 g (0.28 oz) 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 anytime without notice.