

### Features

- ◆ Highest power density 30W converter!  
Ultra compact size: 1.0" x 1.0" x 0.4"
- ◆ Shielded metal case with isolated baseplate
- ◆ Wide 2:1 input voltage range
- ◆ Very high efficiency across full load range up to 92%
- ◆ Over temperature protection
- ◆ Operating temp. range  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$  and up to  $85^{\circ}\text{C}$  with heat-sink
- ◆ Ultra low no load input current
- ◆ Remote On/Off control
- ◆ Output voltage adjustable
- ◆ I/O isolation voltage 1500 VDC
- ◆ RoHS 2011/65/EU compliant
- ◆ 3-year product warranty



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 wide 2:1 input voltage range and precisely regulated output voltages, even under no load conditions. Highest efficiency across load range makes this product very reliable and applicable in temperature ranges of up to  $85^{\circ}\text{C}$ . With a low input current at no 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 30-1210	<b>9 – 18 VDC</b> (12 VDC nominal)	3.3 VDC	7000 mA	86 %
THN 30-1211		5.0 VDC	6000 mA	89 %
THN 30-1212		12 VDC	2500 mA	89 %
THN 30-1213		15 VDC	2000 mA	89 %
THN 30-1215		24 VDC	1250 mA	89 %
THN 30-1222		$\pm 12$ VDC	$\pm 1250$ mA	89 %
THN 30-1223		$\pm 15$ VDC	$\pm 1000$ mA	90 %
THN 30-2410		<b>18 – 36 VDC</b> (24 VDC nominal)	3.3 VDC	7000 mA
THN 30-2411	5.0 VDC		6000 mA	90 %
THN 30-2412	12 VDC		2500 mA	91 %
THN 30-2413	15 VDC		2000 mA	91 %
THN 30-2415	24 VDC		1250 mA	91 %
THN 30-2422	$\pm 12$ VDC		$\pm 1250$ mA	91 %
THN 30-2423	$\pm 15$ VDC		$\pm 1000$ mA	91 %
THN 30-4810	<b>36 – 75 VDC</b> (48 VDC nominal)		3.3 VDC	7000 mA
THN 30-4811		5.0 VDC	6000 mA	89 %
THN 30-4812		12 VDC	2500 mA	90 %
THN 30-4813		15 VDC	2000 mA	91 %
THN 30-4815		24 VDC	1250 mA	91 %
THN 30-4822		$\pm 12$ VDC	$\pm 1250$ mA	91 %
THN 30-4823		$\pm 15$ VDC	$\pm 1000$ mA	92 %

### Input Specifications

Input current at no load (at nominal input voltage)	12 V models: 12 mA typ 24 V models: 10 mA typ. 48 V models: 8 mA typ.
Start-up voltage	12 V models: < 9.0 VDC 24 V models: < 18 VDC 48 V models: < 36 VDC
Under voltage shut down (lock-out circuit)	12 V models: 8.0 VDC typ. 24 V models: 16 VDC typ. 48 V models: 33 VDC typ.
Surge voltage (1 sec. max.)	12 V models: 25 V max 24 V models: 50 V max. 48 V models: 100 V max.
Reflected input ripple current	30 mA <sub>p-p</sub> typ.
Conducted noise (input)	EN 55022 level A, FCC part 15, level A with external capacitor see: application note
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 V <sub>rms</sub> , perf. criteria A
Recommended input fuse (slow blow)	12 V models: 6300 A 24 V models: 3150 mA 48 V models: 1600 mA

### Output Specifications

Voltage set accuracy	±1 %
Output voltage adjustment range (see application note)	15 & 24 VDC models: +20 / -10 % other single output models: ±10 %
Regulation	- Input variation (V <sub>min</sub> - V <sub>max</sub> ) 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 (measured with output capacitor) (20 MHz bandwidth)	3.3 & 5.0 VDC models: 75 mV <sub>p-p</sub> with (22µF/25V X7R 1812 MLCC) 12 & 15 VDC models: 75 mV <sub>p-p</sub> with (2x 22µF/25V X7R 1812 MLCC) 24 VDC models: 75 mV <sub>p-p</sub> with (2x 6.8µF/50V X7R 1812 MLCC) dual output models: 60 mV <sub>p-p</sub> with (10µF/50V X7R 1812 MLCC)
Temperature coefficient	±0.02 %/K
Output current limitation	at 140 % of I <sub>out</sub> max.
Short circuit protection	hiccup, automatic recovery
Over voltage protection	3.3 VDC models: 3.7 - 5.4 V <sub>out</sub> 5 VDC models: 5.6 - 7.0 V <sub>out</sub> 12 VDC models: 13.5 - 19.6 V <sub>out</sub> 15 VDC models: 18.3 - 22.0 V <sub>out</sub> 24 VDC models: 29.1 - 32.5 V <sub>out</sub>
Start up time (nominal V <sub>in</sub> 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

Max. capacitive load	3.3 VDC models:	10'000 $\mu$ F
	5 VDC models:	7'200 $\mu$ F
	12 VDC models:	1'200 $\mu$ F
	15 VDC models:	1'000 $\mu$ F
	24 VDC models:	375 $\mu$ F
	$\pm$ 12 VDC models:	750 $\mu$ F (each output)
	$\pm$ 15 VDC models:	500 $\mu$ F (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 +25°C, ground benign)		337'000 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 $\pm$ 10%
	other models:	330 kHz $\pm$ 10%
Vibration and thermal shock		MIL-STD-810E
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals	- UL/cUL	<a href="http://www.ul.com">www.ul.com</a> -> certifications -> File e188913 (entry pending)

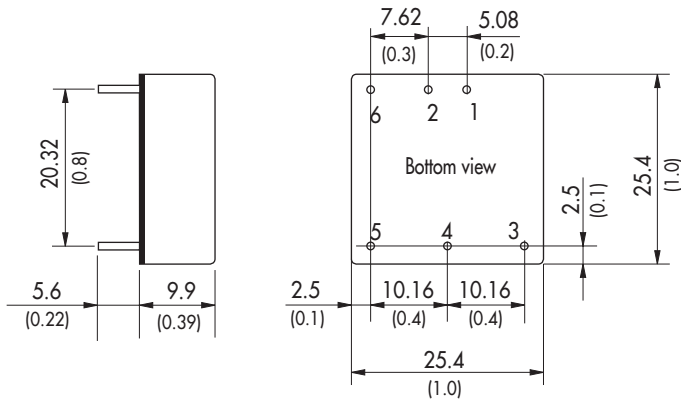
### Physical Specifications

Casing material		copper
Baseplate		non conductive FR4
Potting material		silicon (UL 94V-0 rated)
Weight		16.5 g (0.58 oz)
Soldering temperature		max. 265°C / 10sec.
Environmental compliance	- Reach	<a href="http://www.tracopower.com/products/ten30-reach.pdf">www.tracopower.com/products/ten30-reach.pdf</a>
	- RoHS	RoHS directive 2011/65/EU

**Application note:** [www.tracopower.com/products/thn30-application.pdf](http://www.tracopower.com/products/thn30-application.pdf)

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	

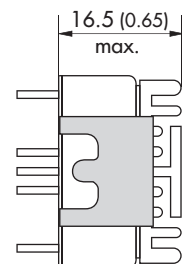
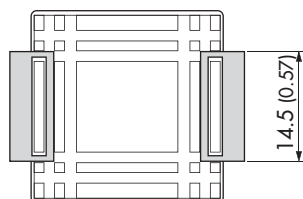
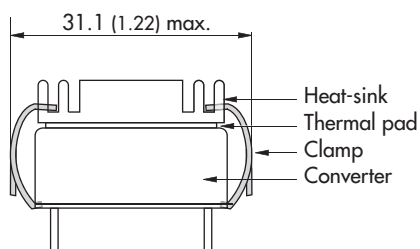
Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing$  1.0 (0.04)  
 Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )  
 Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )

**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: 14.8 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.



Specifications can be changed any time without notice.