

### Features

- ◆ Smallest encapsulated 20W Converter!  
Ultra compact size: 1.0" x 1.0" x 0.4"
- ◆ Shielded metal case with isolated baseplate
- ◆ Wide 2:1 input voltage ranges
- ◆ Very high efficiency up to 90%
- ◆ Output voltage adjustable
- ◆ Remote On/Off control
- ◆ Operating temp. range  $-40^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$   
and up to  $85^{\circ}\text{C}$  with heat-sink
- ◆ I/O isolation voltage 1500 VDC
- ◆ Input filter meets EN 55022 class A  
without external components
- ◆ No minimum load required
- ◆ Lead free design, RoHS compliant
- ◆ 3-year product warranty



The THN-20 series is the latest generation of high performance dc-dc converter modules with highest power density. The product achieves 20W 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 of up to 90% makes this product very reliable and applicable in temperature ranges of up to  $75^{\circ}\text{C}$  or  $85^{\circ}\text{C}$  with optional mounted heat sink. Together with low input current characteristics at minimal 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 20-1210	<b>9 – 18 VDC</b> (12 VDC nominal)	3.3 VDC	4500 mA	86 %
THN 20-1211		5.0 VDC	4000 mA	90 %
THN 20-1212		12 VDC	1670 mA	89 %
THN 20-1213		15 VDC	1330 mA	89 %
THN 20-1222		$\pm 12$ VDC	$\pm 833$ mA	89 %
THN 20-1223		$\pm 15$ VDC	$\pm 667$ mA	89 %
THN 20-2410	<b>18 – 36 VDC</b> (24 VDC nominal)	3.3 VDC	4500 mA	86 %
THN 20-2411		5.0 VDC	4000 mA	90 %
THN 20-2412		12 VDC	1670 mA	90 %
THN 20-2413		15 VDC	1330 mA	90 %
THN 20-2422		$\pm 12$ VDC	$\pm 833$ mA	90 %
THN 20-2423		$\pm 15$ VDC	$\pm 667$ mA	90 %
THN 20-4810	<b>36 – 75 VDC</b> (48 VDC nominal)	3.3 VDC	4500 mA	86 %
THN 20-4811		5.0 VDC	4000 mA	90 %
THN 20-4812		12 VDC	1670 mA	90 %
THN 20-4813		15 VDC	1330 mA	90 %
THN 20-4822		$\pm 12$ VDC	$\pm 833$ mA	90 %
THN 20-4823		$\pm 15$ VDC	$\pm 667$ mA	90 %



### Output Specifications

Max. capacitive load	3.3 VDC models:	7'000 $\mu$ F
	5 VDC models:	5'000 $\mu$ F
	12 VDC models:	850 $\mu$ F
	15 VDC models:	700 $\mu$ F
	$\pm$ 12 VDC models:	500 $\mu$ F (each output)
	$\pm$ 15 VDC models:	350 $\mu$ F (each output)

### General Specifications

Temperature ranges	- Operating without heat sink	-40°C to +75°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	2.0 %/K above 60°C
	- Operating with heat sink	2.0 %/K above 70°C
Thermal inpedance	- Natural convection	17.6°C/W
	- Natural convection with heat sink	14.8°C/W
Humidity (non condensing)		5 % to 95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>550'000 h
Isolation voltage (60sec.)	- Input/Output	1'500 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:	1.5 mA
Switching frequency (fixed)		330 kHz typ. (pulse width modulation PWM)
Vibration and thermal shock		EN 61373, MIL-STD-810E
Safety standards		UL /cUL 60950-1, EN 60950-1, IEC 60950-1
Safety approvals	- UL/cUL	<a href="http://www.ul.com">www.ul.com</a> -> certifications -> File e188913

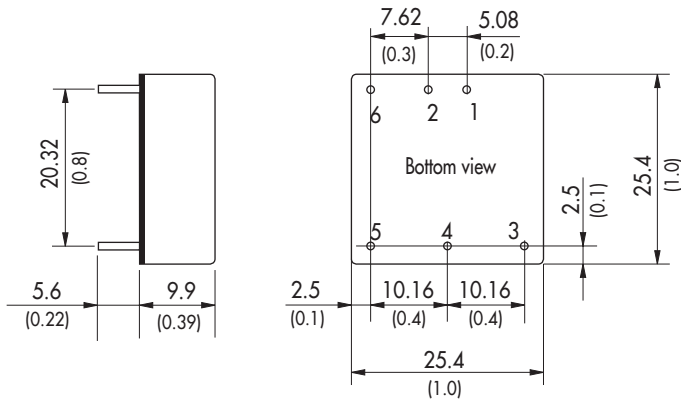
### Physical Specifications

Casing material		nickel coated copper
Baseplate		non conductive FR4
Potting material		silicone (UL 94V-0 rated)
Weight		15 g (0.53 oz)
Soldering temperature		max. 265°C / 10 sec.
Environmental compliance	- Reach	<a href="http://www.tracopower.com/products/thn20-reach.pdf">www.tracopower.com/products/thn20-reach.pdf</a>
	- RoHS	RoHS directive 2011/65/EU

**Application note:** [www.tracopower.com/products/thn20-application.pdf](http://www.tracopower.com/products/thn20-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	

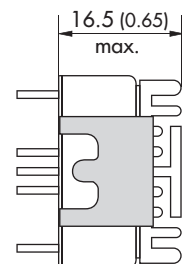
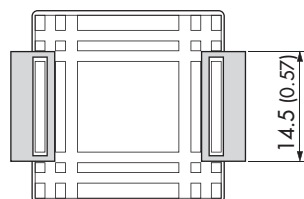
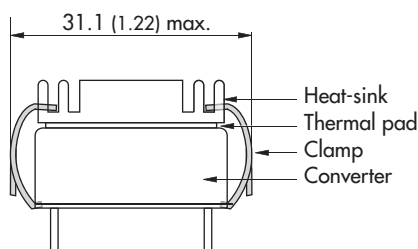
Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing$  1.0 (0.04)  
 Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )  
 Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )

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