

### Features

- ◆ 10 Watt in 1" x 1" package
- ◆ Shielded metal case with isolated baseplate
- ◆ Ultrawide 4:1 input voltage ranges
- ◆ 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
- ◆ Cost optimized design
- ◆ Industry standard pinout
- ◆ 3-year product warranty



The THL 10WI is a series of general purpose 10 Watt dc/dc-converters packed in the compact 1" x 1" case and is a pin to pin replacement for the popular 1" x 2" size products. The industrial standard pinout, the ultra wide 4:1 input voltage range and the input filter that meets EN 55022 Class A without external components make these converters easy to design in and suitable for to cost optimize many existing and new applications.

The models have a remote On/Off control, short circuit and overvoltage protection and are applicable in temperature ranges of up to  $+75^{\circ}\text{C}$  or  $+85^{\circ}\text{C}$  with optional mounted heat sink. Typical applications are instrumentation, distributed power architectures in communication and industrial electronics.

### Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
THL 10-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	2200 mA	86 %
THL 10-2411WI		5.1 VDC	2000 mA	84 %
THL 10-2412WI		12 VDC	830 mA	86 %
THL 10-2413WI		15 VDC	660 mA	87 %
THL 10-2415WI		24 VDC	410 mA	86 %
THL 10-2421WI		$\pm 5.0$ VDC	$\pm 1000$ mA	84 %
THL 10-2422WI		$\pm 12$ VDC	$\pm 410$ mA	86 %
THL 10-2423WI		$\pm 15$ VDC	$\pm 330$ mA	87 %
THL 10-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	2200 mA	85 %
THL 10-4811WI		5.1 VDC	2000 mA	84 %
THL 10-4812WI		12 VDC	830 mA	86 %
THL 10-4813WI		15 VDC	660 mA	87 %
THL 10-4815WI		24 VDC	410 mA	86 %
THL 10-4821WI		$\pm 5.0$ VDC	$\pm 1000$ mA	84 %
THL 10-4822WI		$\pm 12$ VDC	$\pm 410$ mA	86 %
THL 10-4823WI		$\pm 15$ VDC	$\pm 330$ mA	87 %

### Input Specifications

Input current at no load (at nominal input voltage)	24 V models: 30 mA typ. 48 V models: 20 mA typ.
Input current at full load (at nominal input voltage)	24 V; 3.3 VDC models: 400 mA typ. 24 V; other models: 500 mA typ.. 48 V; 3.3 VDC models: 200 mA typ. 48 V; other models: 250 mA typ.
Start-up voltage / under voltage lockout (hysteresis for assertive on)	24 V models: 9 VDC / 8.5 VDC (or lower) 48 V models: 18 VDC / 17 VDC (or lower) (long term operation at undervoltage will damage the converter!)
Surge voltage (1 sec. max.)	24 Vin models: 50 V max. 48 Vin models: 100 V max.
Conducted noise (input)	EN 55022 class A, FCC part 15, level A without external components
Recommended input fuse (slow blow)	24 V models: 2000 mA 48 V models: 1000 mA

### Output Specifications

Voltage set accuracy	±2 %
Regulation	– Input variation (Vmin – Vmax) 1.0 % max. – Load variation single output models: 1.2 % max. (15 – 100 % load) dual output models: 2.0 % max. (15 – 100 % balanced load)
Minimum load	15 %
Ripple and noise (20 MHz bandwidth)	60 mVp-p typ.
Temperature coefficient	±0.02 %/K
Output current limitation	>110 % of Iout max.
Short circuit protection	indefinite, automatic recovery
Transient response setting time	300 µs typ. (25 % load step change)
Maximum capacitive load	3.3 VDC models: 560 µF 5 VDC models: 560 µF 12 VDC models: 150 µF 15 VDC models: 150 µF 24 VDC models: 68 µF ±5.0 VDC models: 220 µF (each output) ±12 VDC models: 100 µF (each output) ±15 VDC models: 100 µF (each output)

### General Specifications

Temperature ranges	<ul style="list-style-type: none"> <li>- Operating without heat sink</li> <li>- Operating with heat sink</li> <li>- Case temperature</li> <li>- Storage</li> </ul>	<ul style="list-style-type: none"> <li>-40°C to +75°C (with derating)</li> <li>-40°C to +85°C (with derating)</li> <li>+100°C max.</li> <li>-40°C to +125°C</li> </ul>
Power derating	<ul style="list-style-type: none"> <li>- Operating without heat sink</li> <li>- Operating with heat sink</li> </ul>	<ul style="list-style-type: none"> <li>2.5 %/K above +60°C</li> <li>3.5 %/K above +70°C</li> </ul>
Thermal impedance	<ul style="list-style-type: none"> <li>- Natural convection</li> <li>- Natural convection with heat sink</li> </ul>	<ul style="list-style-type: none"> <li>18.2°C/W</li> <li>15.8°C/W</li> </ul>
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>350'000 h
Isolation voltage (60 sec.)	- Input/Output	1'500 VDC
Isolation capacitance	- Input/Output	1200 pF max.
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>	<ul style="list-style-type: none"> <li>2.5 ... 50 VDC or open circuit</li> <li>0 ... +1.0 VDC or short circuit pin 6 and pin 2</li> <li>10 mA max.</li> </ul>
Switching frequency (fixed)		400 kHz typ. (pulse width modulation PWM)
Altitude during operation		5'000 m max. (16'400 ft) approved
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals	<ul style="list-style-type: none"> <li>- UL/cUL</li> <li>- CB test certificate according IEC 60950-1</li> <li>- CSA certificate for UL/cUL 60950-1</li> </ul>	<ul style="list-style-type: none"> <li><a href="http://www.ul.com">www.ul.com</a> -&gt; File no. e188913 (entry pending)</li> <li><a href="http://www.tracopower.com/products/thl10wi-cb.pdf">www.tracopower.com/products/thl10wi-cb.pdf</a></li> <li><a href="http://www.tracopower.com/products/thl10wi-csa.pdf">www.tracopower.com/products/thl10wi-csa.pdf</a></li> </ul>
Environmental compliance	<ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>	<ul style="list-style-type: none"> <li><a href="http://www.tracopower.com/products/thl10wi-reach.pdf">www.tracopower.com/products/thl10wi-reach.pdf</a></li> <li>RoHS directive 2011/65/EU</li> </ul>

### Physical Specifications

Casing material	metal
Baseplate	non conductive FR4
Potting material	epoxy (UL 94V-0 rated)
Weight	15 g (0.53oz)
Soldering temperature	max. +260°C / 10sec.

**Application note :** [www.tracopower.com/products/thl10wi-application.pdf](http://www.tracopower.com/products/thl10wi-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	No pin	Common
5	-Vout	-Vout
6	Remote On/Off	

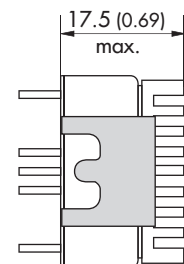
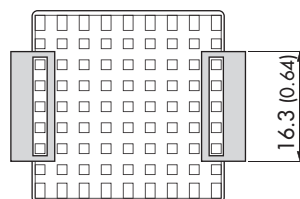
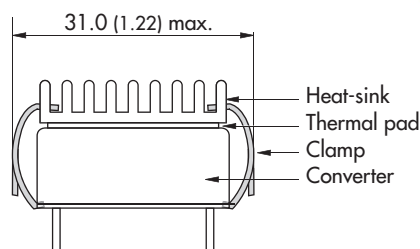
Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing$  1.0 (0.04)  
 Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )  
 Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )

**Heat-Sink (Option)**

**Order code:** THL-HS1  
 (cont.: heat-sink, thermal pad, 2 clamps)  
**Material:** Aluminum  
**Finish:** Anodic treatment (black)  
**Weight:** 4.0 g (0.14oz) 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.



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