

# **DC/DC Converters**

THL 10WI Series, 10 Watt

#### **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°C to +75°C and up to +85°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  $1'' \times 1''$  case and is a pin to pin replacement for the popular  $1'' \times 2''$  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°C or +85°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		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	9 – 36 VDC	15 VDC	660 mA	87 %
THL 10-2415WI	(24 VDC nominal)	24 VDC	410 mA	86 %
THL 10-2421WI		±5.0 VDC	±1000 mA	84 %
THL 10-2422WI		±12 VDC	±410 mA	86 %
THL 10-2423WI		±15 VDC	±330 mA	87 %
THL 10-4810WI		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	18 – 75 VDC	15 VDC	660 mA	87 %
THL 10-4815WI	(48 VDC nominal)	24 VDC	410 mA	86 %
THL 10-4821WI		±5.0 VDC	±1000 mA	84 %
THL 10-4822WI		±12 VDC	±410 mA	86 %
THL 10-4823WI		±15 VDC	±330 mA	87 %



Input Specifications Input current at no load (at )	nominal input valtage!	24 V models:	30 mA typ.
input current at no load (all	nominai inpui voliagej	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:	
		48 V; 3.3 VDC models:	200 mA typ.
		48 V; other models:	250 mA typ.
Start-up voltage / under voltage lockout			9 VDC / 8.5 VDC (or lower)
(hysteresis for assertive on)		48 V models:	
			(long term operation at undervoltage will
			demage the converter!)
Surge voltage (1 sec. max.)		24 Vin models:	
		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:	
·		48 V models:	1000 mA
Output Specifications	S		
Voltage set accuracy			±2 %
Regulation	- Input variation (Vmin -	- Vmax)	1.0 % max.
	<ul> <li>Load variation</li> </ul>	single output models:	<b>1.2</b> % max. (15 – 100 % load)
		dual output models:	<b>2.0</b> % max. (15 – 100 % balanced load)
Minimum load			15 % of rated max. current (operation at lower
			load condition will not damage the converters.
			However, they may not meet all listed specifications)
Ripple and noise (20 MHz	bandwidth)		60 mVp-p typ.
Temperature coefficient			±0.02 %/K
Output current limitation			>110 % of lout max.
Short circuit protection			indefinite, automatic recovery
Transient response setting ti	me		300 µs typ. (25 % load step change)
Maximum capacitive load		3.3 VDC models:	·
		5 VDC models:	•
		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: ±15 VDC models:	100 μF (each output) 100 μF (each output)



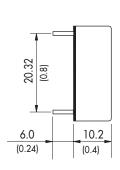
General Specification		
Temperature ranges	<ul><li>Operating without heat sink</li><li>Operating with heat sink</li><li>Case temperature</li><li>Storage</li></ul>	-40°C to +75°C (with derating) -40°C to +85°C (with derating) +100°C max. -40°C to +125°C
Power derating	<ul><li>Operating without heat sink</li><li>Operating with heat sink</li></ul>	2.5 %/K above +60°C 3.5 %/K above +70°C
Thermal inpedance	<ul><li>Natural convection</li><li>Natural convection with heat sink</li></ul>	18.2°C/W 15.8°C/W
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	- On: - Off: - Off idle current:	2.5 50 VDC or open circuit 0 +1.0 VDC or short circuit pin 6 and pin 2 10 mA max.
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/cUL  - CB test certificate according IEC 60950-1  - CSA certificate for UL/cUL 60950-1	www.ul.com -> File no. e188913 (entry pending) www.tracopower.com/products/thl10wi-cb.pdf www.tracopower.com/products/thl10wi-csa.pdf
Environmental compliance	- Reach - RoHS	www.tracopower.com/products/thl10wi-reach.pdl RoHS directive 2002/95/EC
<b>Physical Specification</b>	ns	
Casing material		metal
Baseplate		non conductive FR4
Potting material		epoxy (UL 94V-0 rated)
Weight		15 g (0.53oz)

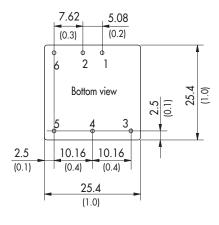
Application note: <u>www.tracopower.com/products/thl10wi-application.pdf</u>

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  $\emptyset$  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

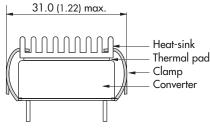


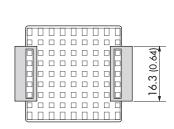
### Note:

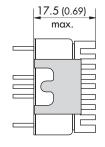
The product label on converter has to be removed before mounting the heat-sink.

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 any time without notice.



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