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

C US 226037 CB Scheme UL 60950-1 C US pending UL 60950-1

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°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	**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		±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	**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		±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 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 demage 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	– Operating without heat sink – Operating with heat sink – Case temperature – Storage	**–40°C to +75°C** (with derating) **–40°C to +85°C** (with derating) **+100°C max.** **–40°C to +125°C**
Power derating	– Operating without heat sink – Operating with heat sink	**2.5 %/K above +60°C** **3.5 %/K above +70°C**
Thermal inpedance	– Natural convection – Natural convection with heat sink	**18.2 K/W** **15.8 K/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 s)	– 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	– Certification documents	**UL/cUL** (File no. e188913, entry pending) **CB 60950-1:2005** (2nd Ed.)**+ A1:2009 + A2:2013** **CSA 60950-1** www.tracopower.com/overview/thl10wi
Environmental compliance	– Reach – RoHS	www.tracopower.com/products/reach-declaration.pdf **RoHS directive 2011/65/EU**

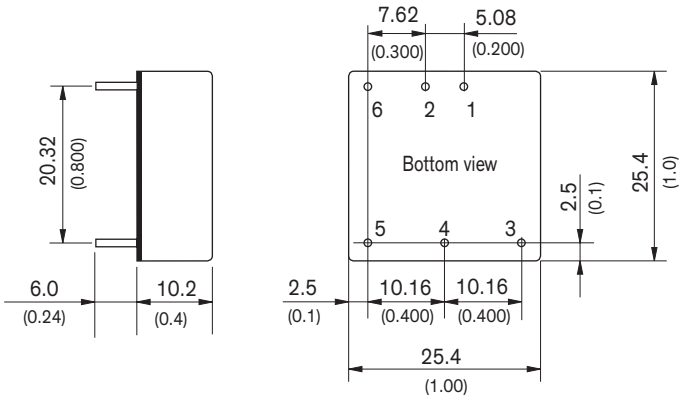
Physical Specifications

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

Application note : www.tracopower.com/overview/thl10wi

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

Outline Dimensions

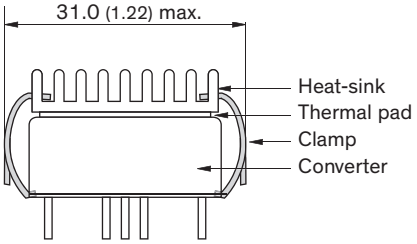


Pin-Out		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	+Vin (Vcc)
2	–Vin (GND)	–Vin (GND)
3	+ Vout	+ Vout
4	No pin	Common
5	–Vout	–Vout
6	Remote On/Off	

Dimensions in [mm], () = Inch
Pin diameter ø 1.0 (0.04)
Pin pitch tolerances: ±0.25 (±0.01)
Tolerances: ±0.5 (±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.