Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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DC/DC Converters

THL 10 Series, 10 Watt

Features

- 10 Watt in 1" x 1" package
- Shielded metal case with isolated baseplate
- Wide 2:1 input voltage ranges
- Operating temp. range –40°C to +80°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 10 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 wide 2:1 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 short circuit and overvoltage protection and are applicable in temperature ranges of up to +80°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 10-1210		3.3 VDC	2500 mA	82 %
THL 10-1211		5.1 VDC	2000 mA	85 %
THL 10-1212		12 VDC	830 mA	87 %
THL 10-1213	**9 – 18 VDC**	15 VDC	670 mA	88 %
THL 10-1221	(12 VDC nominal)	±5.0 VDC	±1000 mA	84 %
THL 10-1222		±12 VDC	±416 mA	87 %
THL 10-1223		±15 VDC	±333 mA	87 %
THL 10-2410		3.3 VDC	2500 mA	83 %
THL 10-2411		5.1 VDC	2000 mA	85 %
THL 10-2412		12 VDC	830 mA	87 %
THL 10-2413	**18 – 36 VDC**	15 VDC	670 mA	89 %
THL 10-2421	(24 VDC nominal)	±5.0 VDC	±1000 mA	85 %
THL 10-2422		±12 VDC	±416 mA	88 %
THL 10-2423		±15 VDC	±333 mA	89 %
THL 10-4810		3.3 VDC	2500 mA	83 %
THL 10-4811		5.1 VDC	2000 mA	85 %
THL 10-4812		12 VDC	830 mA	89 %
THL 10-4813	**36 – 75 VDC**	15 VDC	670 mA	89 %
THL 10-4821	(48 VDC nominal)	±5.0 VDC	±1000 mA	86 %
THL 10-4822		±12 VDC	±416 mA	87 %
THL 10-4823		±15 VDC	±333 mA	88 %

Input Specifications

Input current at no load (at nominal input voltage)	12 Vin models:	15 mA typ.
	24 Vin models:	12 mA typ.
	48 Vin models:	10 mA typ.
Input current at full load (at nominal input voltage)	12 Vin; 3.3 VDC models:	800 mA typ.
	12 Vin; other models:	1000 mA typ.
	24 Vin; 3.3 VDC models:	400 mA typ.
	24 Vin; other models:	500 mA typ.
	48 Vin; 3.3 VDC models:	200 mA typ.
	48 V; other models:	250 mA typ.
Start-up voltage / under voltage lockout (hysteresis for assertive on)	12 Vin models:	9.0 / 8.5 VDC (or lower)
	24 Vin models:	18 / 17 VDC (or lower)
	48 Vin models:	36 / 34 VDC (or lower)
		(long term operation at undervoltage will demage the converter!)
Surge voltage (1 sec. max.)	12 Vin models:	25 V 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
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, ±1 kV perf. criteria A with external capacitor
Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A

Output Specifications

Voltage set accuracy			±2 %
Regulation	– Input variation (Vmin – Vmax)		1.0 % max.
	– Load variation	single output models:	0.5 % max. (0 – 100 % load)
		dual output models:	1.0 % max. (0 – 100 % balanced load)
		cross regulation:	5 % max. (25% / 100% asymmetrical load)
Minimum load			not required
Ripple and noise (20 MHz bandwidth)		3.3 & 5.0 VDC models:	80 mVp-p typ.
		other models:	100 mVp-p typ.
Temperature coefficient			±0.02 %/K
Output current limitation			>110 % of Iout max.
Short circuit protection			hiccup, automatic recovery
Transient response setting time			300 µs typ. (25 % load step change)
Maximum capacitive load		3.3 VDC models:	4700 µF
		5.1 VDC models:	2200 µF
		12 VDC models:	330 µF
		15 VDC models:	220 µF
		±5.0 VDC models:	1000 µF (each output)
		±12 VDC models:	150 µF (each output)
		±15 VDC models:	100 µF (each output)

General Specifications

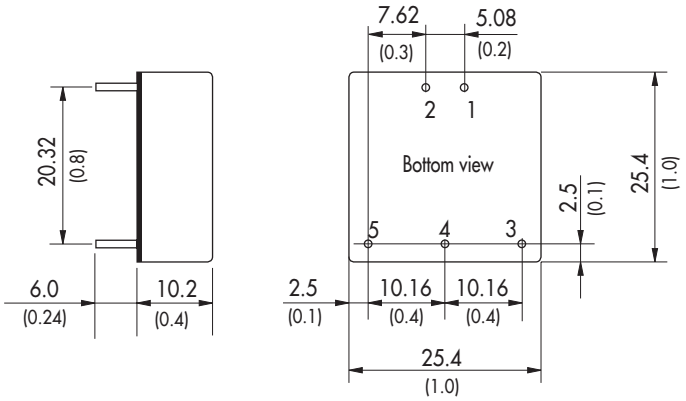
Temperature ranges	– Operating without heat sink	–40°C to +80°C (with derating)
	– Operating with heat sink	–40°C to +85°C (with derating)
	– Case temperature	+100°C max.
	– Storage	–50°C to +125°C
Power derating	– Operating without heat sink	2.5 %/K above +60°C
	– Operating with heat sink	3.5 %/K above +70°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		2'596'000 h
Isolation voltage (60 sec.)	– Input/Output	1'500 VDC
Isolation capacitance	– Input/Output	2000 pF max.
Isolation resistance	– Input/Output (500 VDC)	>1'000 MOhm
Switching frequency (fixed)		300 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
	– Certification documents (pending)	www.tracopower.com/overview/thl10
Environmental compliance	– Reach	www.tracopower.com/products/reach-declaration.pdf
	– RoHS	RoHS directive 2011/65/EU

Physical Specifications

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

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

Outline Dimensions

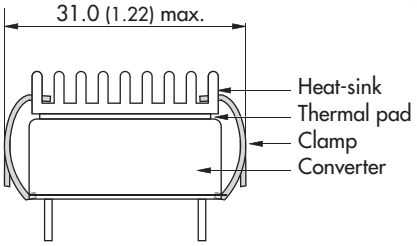


Pin-Out		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	+Vin (Vcc)
2	–Vin (GND)	–Vin (GND)
3	+ Vout	+ Vout
4	No pin	Common
5	–Vout	–Vout

Dimensions in [mm], () = Inch
Pin diameter ⌀ 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.