

Features

- ◆ Highest power density 25W converter!
Ultra compact design: 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°C to +80°C
and up to +85°C with heat-sink
- ◆ I/O isolation voltage 1500 VDC
- ◆ 3-year product warranty



The THL 25 series is the latest generation of dc-dc converter modules with highest power density. The product achieves 25 Watt output power and comes in a metal case with small dimensions of only 1.0"x 1.0"x 0.4".

All models have a wide 2:1 input voltage range and precisely regulated output voltages. High efficiency of up to 90% makes this product very reliable and applicable in temperature ranges of up to +80°C or up to +85°C with optional mounted heat sink. 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.
THL 25-1210	9 – 18 VDC (12 VDC nominal)	3.3 VDC	6000 mA	87 %
THL 25-1211		5.0 VDC	5000 mA	89 %
THL 25-1212		12 VDC	2090 mA	89 %
THL 25-1213		15 VDC	1670 mA	89 %
THL 25-1222		±12 VDC	±1040 mA	89 %
THL 25-1223		±15 VDC	±840 mA	89 %
THL 25-2410	18 – 36 VDC (24 VDC nominal)	3.3 VDC	6000 mA	88 %
THL 25-2411		5.0 VDC	5000 mA	90 %
THL 25-2412		12 VDC	2090 mA	90 %
THL 25-2413		15 VDC	1670 mA	90 %
THL 25-2422		±12 VDC	±1040 mA	89 %
THL 25-2423		±15 VDC	±840 mA	89 %
THL 25-4810	36 – 75 VDC (48 VDC nominal)	3.3 VDC	6000 mA	88 %
THL 25-4811		5.0 VDC	5000 mA	90 %
THL 25-4812		12 VDC	2090 mA	90 %
THL 25-4813		15 VDC	1670 mA	90 %
THL 25-4822		±12 VDC	±1040 mA	89 %
THL 25-4823		±15 VDC	±840 mA	89 %

Input Specifications

Input current at no load (at nominal input voltage)	12 Vin models: 80 mA typ. 24 Vin models: 55 mA typ. 48 Vin models: 40 mA typ.
Recommended input fuse (slow blow)	12 Vin models: 5000 mA 24 Vin models: 2500 mA 48 Vin models: 1250 mA
Start-up voltage	12 Vin models: 9 VDC (or lower) 24 Vin models: 18 VDC (or lower) 48 Vin models: 36 VDC (or lower)
Surge voltage (0.1 sec. max.)	12 Vin models: 25 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max.
Reflected input ripple current	12 Vin models: 80 mAp-p typ. 24 Vin models: 50 mAp-p typ. 48 Vin models: 30 mAp-p typ.
Conducted noise (input)	EN 55022 class A with external L/C EN 55022 class B with external filter see application note
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 (with external input capacitor)	EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 1 kV perf. criteria A external input capacitor: Nippon chemi-con KY 220 μ F, 100 V, ESR 48 mOhm
Conducted immunity	EN 61000-4-6, 10 Vrms, perf. criteria A

Output Specifications

Voltage set accuracy	± 1 %
Output voltage adj. range	± 10 % for single output models only. Trim up via resistor between Trim and -Vout Trim down via resistor between Trim and +Vout resistor values see application note
Regulation	– Input variation (Vmin – Vmax) – Load variation – Cross regulation single output models: dual output models: dual output models: 0.2 % max. 0.2 % max. (0 – 100 % load) 1.0 % max. (0 – 100 % balanced load) 5.0 % max. (25 – 100 % asymmetrical load)
Minimum load	not required
Ripple and noise (20 MHz bandwidth)	3.3 & 5.0 VDC models: 100 mVp-p typ. 12 & 15 VDC models: 150 mVp-p typ.
Temperature coefficient	± 0.02 %/K
Output current limitation	at 150 % of Iout max., hiccup
Short circuit protection	indefinite, automatic recovery
Over voltage protection	shutdown at +20% of nominal output
Transient response setting time	250 μ s typ. (25% load step change)
Max. capacitive load	3.3 VDC models: 10'300 μ F 5 VDC models: 6'800 μ F 12 VDC models: 1'200 μ F 15 VDC models: 750 μ F ± 12 VDC models: 680 μ F (each output) ± 15 VDC models: 380 μ F (each output)

General Specifications

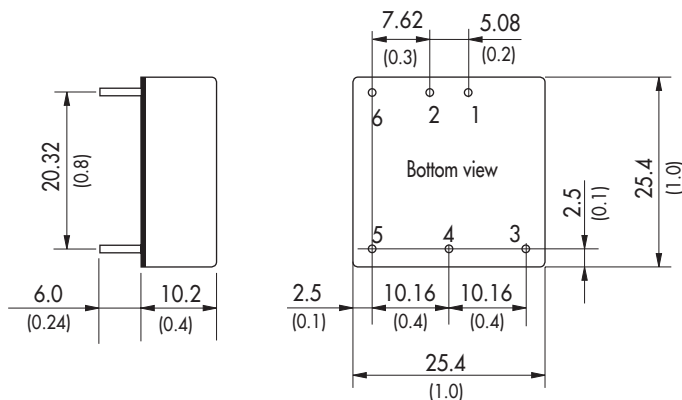
Temperature ranges	– Operating (natural convection 20 LFM)	–40°C to +80°C (with derating)
	– Operating with heat sink (natural convection 20 LFM)	–40°C to +85°C (with derating)
	– Case temperature	+105°C max.
	– Storage	–50°C to +125°C
Load derating (natural convection 20 LFM, typical values over series)	– without heat sink	2.0 %/K above +55°C
	– with heat sink	2.5 %/K above +65°C
		see application note for particular models
Thermal impedance	– Natural convection	17.6°C/W
	– Natural convection with heat sink	14.8°C/W
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>372'000 h
Isolation voltage (60sec.)	– Input/Output	1500 VDC
Isolation capacitance	– Input/Output	2000 pF max.
Isolation resistance	– Input/Output (500 VDC)	>1000 MOhm
Remote On/Off	– On:	3.5 ... 15 VDC or open circuit
	– Off:	0 ... 1.2 VDC or short circuit pin 6 and pin 2
	– Off idle current:	3 mA typ.
Switching frequency (fixed)		285 kHz typ. (pulse width modulation PWM)
Safety standards (designed to meet)		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals	– CB test certificate according IEC 60950-1	www.tracopower.com/products/thl25-cb.pdf
	– CSA certificate for UL/CSA 60950-1 (pending)	www.tracopower.com/products/thl25-csa.pdf
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)
Weight	16.5 g (0.58 oz)
Soldering temperature	max. 260°C / 10sec.

Application note : www.tracopower.com/products/thl25-application.pdf

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: ± 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 g (0.14 oz) without converter

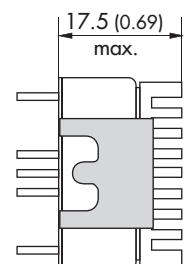
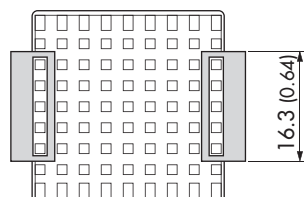
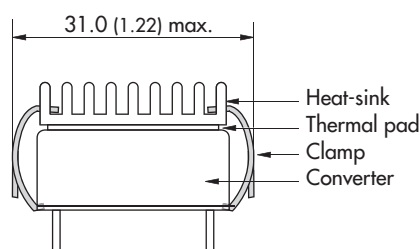
Thermal impedance after assembling: 15.8 K/W



Note:

The product label on converter has to be removed before mounting the heat-sink.
 For volume orders converters will be supplied with mounted heat-sink. 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