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**

c SP us 226037 CB Scheme IEC 60950-1

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 µF, 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)		0.2 % max.
	– Load variation	single output models:	0.2 % max. (0 – 100 % load)
		dual output models:	1.0 % max. (0 – 100 % balanced load)
	–Cross regulation	dual output models:	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 µs typ. (25% load step change)
Max. capacitive load		3.3 VDC models:	10'300 µF
		5 VDC models:	6'800 µF
		12 VDC models:	1'200 µF
		15 VDC models:	750 µF
		±12 VDC models:	680 µF (each output)
		±15 VDC models:	380 µF (each output)

General Specifications

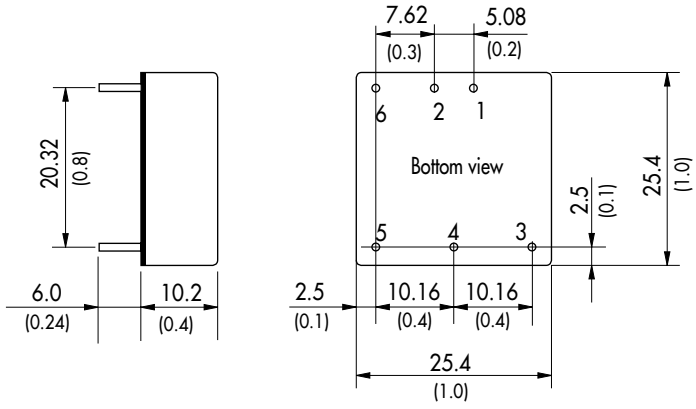
Temperature ranges	– Operating (natural convection 20 LFM) – Operating with heat sink (natural convection 20 LFM) – Case temperature – Storage	–40°C to +80°C (with derating) –40°C to +85°C (with derating) +105°C max. –50°C to +125°C
Load derating (natural convection 20 LFM, typical values over series)	– without heat sink – with heat sink	2.0 %/K above +55°C 2.5 %/K above +65°C see application note for particular models
Thermal impedance	– Natural convection – Natural convection with heat sink	17.6°C/W 14.8°C/W
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>313'300 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: – Off: – Off idle current:	3.5 ... 15 VDC or open circuit 0 ... 1.2 VDC or short circuit pin 6 and pin 2 3 mA typ.
Switching frequency (fixed)		285 kHz typ. (pulse width modulation PWM)
Safety standards	– Certification documents	CAN/CSA-C22.2 No 60950-1-07, 2nd ed; A1:2011 ANSI/UL No. 60950-1, 2nd ed.; A1:2011 IEC 60950-1:2005 (2nd edition); Am 1:2009 EN 60950-1:2006/A11:2009/A1:2010/A12:2011
Environmental compliance	– Reach – 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.

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

Outline Dimensions

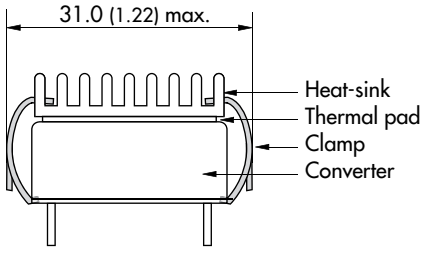


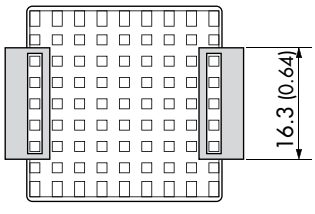
Pin-Out		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	+Vin (Vcc)
2	–Vin (GND)	–Vin (GND)
3	+Vout	+Vout
4	Trim	Common
5	–Vout	–Vout
6	Remote On/Off	

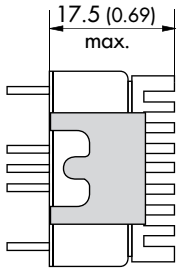
Dimensions in [mm], () = Inch
Pin diameter ø 1.0 (0.04)
Pin pitch tolerances: ±0.25 (±0.01)
Tolerances: ±0.5 (±0.02)

Heat-Sink (Option)

Order code: **THL-HS1**
(cont.: heat-sink, thermal pad, 2 clamps)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 4 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.