DC/DC Converters

THL 25WI Series, 25 Watt

UL 60950-1 IEC 60950-1

Features

- Highest power density 25W converter! Ultra compact design: 1.0" x 1.0" x 0.4"
- Shielded metal case with isolated baseplate
- Ultra wide 4 : 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 25WI 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 4:1 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 25-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	6000 mA	87 %
THL 25-2411WI		5.0 VDC	5000 mA	89 %
THL 25-2412WI		12 VDC	2090 mA	89 %
THL 25-2413WI		15 VDC	1670 mA	90 %
THL 25-2422WI		±12 VDC	±1040 mA	89 %
THL 25-2423WI		±15 VDC	±840 mA	89 %
THL 25-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	6000 mA	88 %
THL 25-4811WI		5.0 VDC	5000 mA	90 %
THL 25-4812WI		12 VDC	2090 mA	90 %
THL 25-4813WI		15 VDC	1670 mA	90 %
THL 25-4822WI		±12 VDC	±1040 mA	89 %
THL 25-4823WI		±15 VDC	±840 mA	89 %

Input Specifications

Input current at no load (at nominal input voltage)	24 Vin models: 48 Vin models:	85 mA typ. 45 mA typ.
Recommended input fuse (slow blow)	24 Vin models: 48 Vin models:	2500 mA 1250 mA
Start-up voltage	24 Vin models: 48 Vin models:	9 VDC (or lower) 18 VDC (or lower)
Surge voltage (0.1 sec. max.)	24 Vin models: 48 Vin models:	50 V max. 100 V max.
Reflected input ripple current	24 Vin models: 48 Vin models:	50 mAp-p typ. 30 mAp-p typ.
Conducted noise (input)		EN 55022 class A with external L/C EN 55022 class B with external filter
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
Start up time			30 ms
Ripple and noise (20 MHz bandwidth)		3.3 & 5.0 VDC models: 12 & 15 VDC models:	100 mVp-p typ. 150 mVp-p typ.
Temperature coefficient			±0.02 %/K
Output current limitation			at 150 % of Iout max., hiccup
Short circuit protection			indefinite, hiccup automatic recovery
Over voltage protection			shutdown at +20% of nominal output
Transient recovery time			250 µs typ. (25% load step change)
Transient response deviation			± 5% max. (25% load step change)
Max. capacitive load		3.3 VDC models: 5 VDC models: 12 VDC models: 15 VDC models: ±12 VDC models: ±15 VDC models:	10'300 µF 6'800 µF 1'200 µF 750 µF 680 µF (each output) 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	– without heat sink – with heat sink	2.0 %/K above +55°C 2.5 %/K above +65°C
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)		>315'000 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: – 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)
Altitude during operation		4'000 m max. (13'123 ft) approved
Safety standards (designed to meet)		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals	– CSA certificate of compliance – CB test certificate – Certification documents	CAN/CSA-C22.2 No 60950-1-07, Am 1:2011 ANSI/UL Std No 60950-1, 2nd Ed, AM 1:2011 IEC 60950-1:2005 2nd Ed, Am 1:2009 www.tracopower.com/overview/thl25wi
Environmental compliance	– Reach – RoHS	www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU

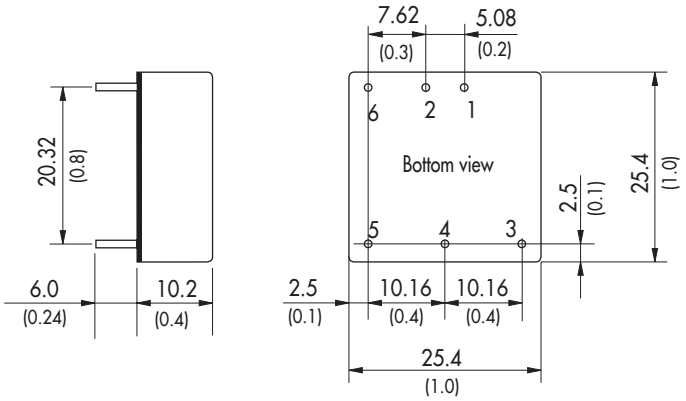
Physical Specifications

Casing material	aluminium alloy, black anodized coating
Baseplate	non conductive FR4
Potting material	epoxy (UL 94V-0 rated)
Pin material	copper alloy with gold plated subplate
Weight	16.5 g (0.58 oz)
Soldering temperature	max. 260°C / 10sec.

Supporting documents : www.tracopower.com/overview/thl25wi

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

Outline Dimensions

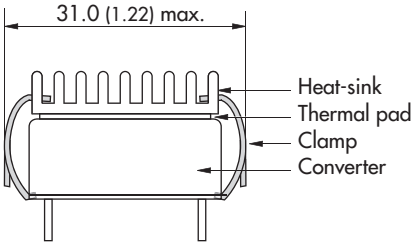


Pin-Out		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	+Vin (Vcc)
2	–Vin (GND)	–Vin (GND)
3	+Vout	+Vout
4	Trim	Common
5	–Vout	–Vout
6	Remote On/Off	

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 (optional)

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.