TRACO POWER

DC/DC Converter

THL 15WI Series, 15 Watt

- **15 Watt converter in a 1" x 1" metal package**
- **Cost efficient design**
- **Ultra wide 4:1 input voltage range: 9-36 and 18-75 VDC**
- **Operating temperature range -40 to +70 °C without derating**
- **Internal EN 55032 class A filter**
- **1'500 VDC I/O-isolation**
- **Protection against overvoltage, overload and short circuit**
- **Remote On/Off and trim function**
- **Optional heatsink for increased temperature capabilities**
- **3-year product warranty**

UL 62368-1 IEC 62368-1

The THL 15WI series is Traco Power's latest addition to the existing 15 Watt DC/DC converter range. With the focus on combining cost efficiency and quality this isolated high performance 15 Watt DC/DC converter is suitable for many different applications. The series comes in an encapsulated, shielded 1" x 1" x 0.4" metal package and has a fully integrated EN 55032 class A filter. High efficiency up to 91% enables the converter to operate from –40°C to +70°C without derating. All models have an ultra wide 4:1 input voltage range and precisely regulated, isolated outputs. The series meets the latest IT safety certifications (UL 62368-1) and is thus eligible for uses in mobile equipment, instrumentation, distributed power architectures in communication and industrial electronics and everywhere where cost efficiency and quality are critical factors.

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	typ.
THL 15-2410WI	9 - 36 VDC (24 VDC nom.)	3.3 VDC	3'400 mA			86 %
THL 15-2411WI		5 VDC	3'000 mA			88 %
THL 15-2412WI		12 VDC	1'250 mA			88 %
THL 15-2413WI		15 VDC	1'000 mA			89 %
THL 15-2415WI		24 VDC	625 mA			91 %
THL 15-2422WI		+12 VDC	625 mA	–12 VDC	625 mA	89 %
THL 15-2423WI		+15 VDC	500 mA	–15 VDC	500 mA	89 %
THL 15-4810WI	18 - 75 VDC (48 VDC nom.)	3.3 VDC	3'400 mA			86 %
THL 15-4811WI		5 VDC	3'000 mA			88 %
THL 15-4812WI		12 VDC	1'250 mA			89 %
THL 15-4813WI		15 VDC	1'000 mA			89 %
THL 15-4815WI		24 VDC	625 mA			91 %
THL 15-4822WI		+12 VDC	625 mA	–12 VDC	625 mA	90 %
THL 15-4823WI		+15 VDC	500 mA	–15 VDC	500 mA	89 %

Options

THL-HS1	- Optional Heat Sink: www.tracopower.com/products/thl-hs1.pdf

Input Specifications

Input Current	- At no load	24 Vin models:	12 mA typ.
		48 Vin models:	9 mA typ.
	- At full load	24 Vin models:	680 mA typ.
		48 Vin models:	340 mA typ.
Surge Voltage		24 Vin models:	50 VDC max. (1 s max.)
		48 Vin models:	100 VDC max. (1 s max.)
Under Voltage Lockout		24 Vin models:	7.5 VDC typ.
		48 Vin models:	16 VDC typ.
Reflected Ripple Current		24 Vin models:	50 mAp-p typ.
		48 Vin models:	30 mAp-p typ.
Recommended Input Fuse		24 Vin models:	3'800 mA (slow blow)
		48 Vin models:	1'900 mA (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal LC-Type

Output Specifications

Output Voltage Adjustment			±10% (single output models only)
			(By external trim resistor)
		See application note:	www.tracopower.com/overview/thl15wi
			Output power must not exceed rated power!
Voltage Set Accuracy			±1% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models:	0.2% max.
		dual output models:	0.5% max.
	- Load Variation (0 - 100%)	single output models:	0.5% max. (3.3 & 5 Vout models)
			0.2% max. (other output models)
		dual output models:	1% max. (Output 1)
			1% max. (Output 2)
	- Voltage Balance (symmetrical load)	dual output models:	2% max.
	- Cross Regulation (25% / 100% asym. load)	dual output models:	5% max.
Ripple and Noise (20 MHz Bandwidth)	- single output	3.3 Vout models:	75 mVp-p max. (w/ 1 µF, MLCC)
		5 Vout models:	75 mVp-p max. (w/ 1 µF, MLCC)
		12 Vout models:	100 mVp-p max. (w/ 1 µF, MLCC)
		15 Vout models:	100 mVp-p max. (w/ 1 µF, MLCC)
		24 Vout models:	150 mVp-p max. (w/ 1 µF, MLCC)
	- dual output	12 / -12 Vout models:	100 / 100 mVp-p max. (w/ 1 µF, MLCC)
		15 / -15 Vout models:	100 / 100 mVp-p max. (w/ 1 µF, MLCC)
Capacitive Load	- single output	3.3 Vout models:	5'800 µF max.
		5 Vout models:	5'100 µF max.
		12 Vout models:	870 µF max.
		15 Vout models:	560 µF max.
		24 Vout models:	220 µF max.
	- dual output	12 / -12 Vout models:	440 / 440 µF max.
		15 / -15 Vout models:	280 / 280 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			30 ms max.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			130 - 180% of Iout max.
			150% typ. of Iout max.
Overvoltage Protection			120% typ. of Vout nom.
Transient Response	- Response Deviation		3% typ. / 5% max. (75% to 100% Load Step)
	- Response Time		300 µs typ. (75% to 100% Load Step)

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

Safety Specifications

Safety Standards	- IT / Multimedia Equipment		EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents		www.tracopower.com/overview/thl15wi
Pollution Degree			PD 2

EMC Specifications

EMI Emissions	- Conducted Emissions		EN 55032 class A (internal filter) EN 55032 class B (with external filter)
	- Radiated Emissions		EN 55032 class A (with external filter) EN 55032 class B (with external filter)
		External filter proposal:	www.tracopower.com/overview/thl15wi
EMS Immunity			EN 55024 (IT Equipment) EN 55035 (Multimedia)
	- Electrostatic Discharge	Air:	EN 61000-4-2, ±8 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge		EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±1 kV, perf. criteria A
		Ext. input component:	470 µF, 100 V, KY (3.3 & 5 Vout models) 220 µF, 100 V, KY (other models)
	- Conducted RF Disturbances		EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous:	EN 61000-4-8, 100 A/m, perf. criteria A

General Specifications

Relative Humidity			95% max. (non condensing)
Temperature Ranges	- Operating Temperature		–40°C to +90°C
	- Case Temperature		+105°C max.
	- Storage Temperature		–50°C to +125°C
Power Derating	- High Temperature		Depending on model
		See application note:	www.tracopower.com/overview/thl15wi
Cooling System			Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote		On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current		3 mA typ.
	- Remote Pin Input Current		-0.5 to 0.5 mA
Altitude During Operation			5'000 m max.
Switching Frequency			310 - 385 kHz (PWM) 330 kHz typ. (PWM)
Insulation System			Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s		1'500 VDC
	- Input to Output, 1 s		1'800 VDC
	- Input to Case, 60 s		1'000 VDC
	- Output to Case, 60 s		1'000 VDC
Isolation Resistance	- Input to Output, 500 VDC		1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V		1'500 pF max.
Reliability	- Calculated MTBF		1'375'000 h (MIL-HDBK-217F, ground benign)
Washing Process			According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Housing Material			Alu alloy, black anodized coating
Base Material			Non-conductive FR4 (UL 94 V-0 rated)
Potting Material			Epoxy (UL 94 V-0 rated)
Pin Material			Copper Alloy (C6801)

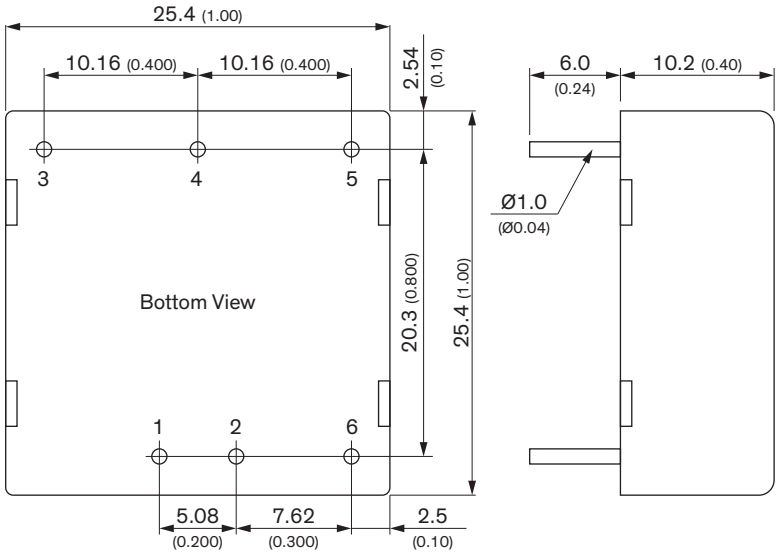
All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Pin Foundation Plating		Nickel (2 - 4 µm)
Pin Surface Plating		Tin (5 - 7 µm), matte
Housing Type		Metal Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		1" x 1"
Soldering Profile		Wave Soldering 260°C / 10 s max.
Weight		15 g
Thermal Impedance	- Case to Ambient	18.2 K/W typ. 15.3 K/W typ. (with Heat Sink)
Environmental Compliance	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.)

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/thl15wi

Outline Dimensions



Dimensions in mm (inch)
Tolerances: x.x ±0.5 (x.xx ±0.02)
x.xx ±0.25 (x.xxx ±0.01)
Pin tolerances: x.x ±0.05 (x.xx ±0.002)

Pinout		
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	Remote On/Off