TRACO POWER

DC/DC Converter

THL 30WI Series, 30 Watt

- **30 Watt converter in a 1” x 1” metal package**
- **Cost efficient design**
- **Wide 4:1 input voltage range: 9-36 and 18-75 VDC**
- **Operating temperature range -40 to +60 °C without derating**
- **1500 VDC I/O-isolation**
- **Protection against overload, overvoltage 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 30WI series extends Traco Power’s existing 30 Watt DC/DC converter portfolio with a new generation of 1” x 1” package converters. With the focus on combining cost efficiency and quality this isolated high performance 30 Watt DC/DC converter series is suitable for many different applications. The series comes in an encapsulated, shielded 1” x 1” x 0.4” metal package and offers integrated remote on/off and trim functions. High efficiency up to 88% enables the converter to operate from –40°C to +60°C without derating. All models have a wide 4:1 input voltage range and precisely regulated, isolated outputs. The series meets the latest IT safety certifications (UL 62368-1) and is suitable 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 30-2410WI	9 - 36 VDC (24 VDC nom.)	3.3 VDC	7'000 mA			87 %
THL 30-2411WI		5 VDC	6'000 mA			88 %
THL 30-2412WI		12 VDC	2'500 mA			88 %
THL 30-2413WI		15 VDC	2'000 mA			88 %
THL 30-2415WI		24 VDC	1'250 mA			88 %
THL 30-2422WI		+12 VDC	1'250 mA	–12 VDC	1'250 mA	88 %
THL 30-2423WI		+15 VDC	1'000 mA	–15 VDC	1'000 mA	88 %
THL 30-4810WI	18 - 75 VDC (48 VDC nom.)	3.3 VDC	7'000 mA			87 %
THL 30-4811WI		5 VDC	6'000 mA			88 %
THL 30-4812WI		12 VDC	2'500 mA			88 %
THL 30-4813WI		15 VDC	2'000 mA			88 %
THL 30-4815WI		24 VDC	1'250 mA			88 %
THL 30-4822WI		+12 VDC	1'250 mA	–12 VDC	1'250 mA	88 %
THL 30-4823WI		+15 VDC	1'000 mA	–15 VDC	1'000 mA	88 %

Options

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

Input Specifications

Input Current	- At no load	24 Vin models:	10 mA typ.
		48 Vin models:	8 mA typ.
	- At full load	24 Vin models:	1'106 mA typ. (3.3 Vout model)
			1'420 mA typ. (5 Vout model)
			1'420 mA typ. (12 Vout model)
			1'420 mA typ. (15 Vout model)
			1'420 mA typ. (24 Vout model)
			1'420 mA typ. (12 / -12 Vout model)
			1'404 mA typ. (15 / -15 Vout model)
		48 Vin models:	553 mA typ. (3.3 Vout model)
			702 mA typ. (5 Vout model)
			702 mA typ. (12 Vout model)
			702 mA typ. (15 Vout model)
			694 mA typ. (24 Vout model)
			694 mA typ. (12 / -12 Vout model)
			694 mA typ. (15 / -15 Vout model)
Surge Voltage		24 Vin models:	50 VDC max. (100 ms max.)
		48 Vin models:	100 VDC max. (100 ms max.)
Start-up Voltage		24 Vin models:	8.4 VDC min. / 8.7 VDC typ. / 9 VDC max.
		48 Vin models:	16.4 VDC min. / 17.2 VDC typ. / 18 VDC max.
Under Voltage Lockout		24 Vin models:	7.8 VDC min. / 8.1 VDC typ. / 8.4 VDC max.
		48 Vin models:	15.5 VDC min. / 16 VDC typ. / 16.4 VDC max.
Reflected Ripple Current			30 mAp-p typ.
Recommended Input Fuse	- 24 Vin input	3.3 Vout models:	4'500 mA (slow blow)
		5 Vout models:	6'500 mA (slow blow)
		12 Vout models:	6'500 mA (slow blow)
		15 Vout models:	6'500 mA (slow blow)
		24 Vout models:	6'500 mA (slow blow)
		12 / -12 Vout models:	6'500 mA (slow blow)
		15 / -15 Vout models:	6'500 mA (slow blow)
	- 48 Vin input	3.3 Vout models:	2'500 mA (slow blow)
		5 Vout models:	3'000 mA (slow blow)
		12 Vout models:	3'000 mA (slow blow)
		15 Vout models:	3'000 mA (slow blow)
		24 Vout models:	3'000 mA (slow blow)
		12 / -12 Vout models:	3'000 mA (slow blow)
		15 / -15 Vout models:	3'000 mA (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal Pi-Type

Output Specifications

Output Voltage Adjustment			±10% (single output models only)
			(By external trim resistor)
		See application note:	www.tracopower.com/thl30wi-adj/
			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:	0.2% max.
		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.

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

Ripple and Noise	- 20 MHz Bandwidth		75 mVp-p max. (w/ 0.1 µF || 47 µF)
Capacitive Load	- single output	3.3 Vout models:	10'000 µF max.
		5 Vout models:	7'200 µF max.
		12 Vout models:	1'250 µF max.
		15 Vout models:	800 µF max.
		24 Vout models:	330 µF max.
	- dual output	12 / -12 Vout models:	680 / 680 µF max.
		15 / -15 Vout models:	470 / 470 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			30 ms max.
Start-up Overshoot Voltage			5% max.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			120 - 170% of Iout max. 150% typ. of Iout max.
Overvoltage Protection			125% typ. of Vout nom. (By Zener diode)
Transient Response	- Response Deviation		3% typ. / 5% max. (25% Load Step)
	- Response Time		250 µs typ. (25% Load Step)

Safety Specifications

Standards	- IT / Multimedia Equipment		EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents		www.tracopower.com/thl30wi-safety-cert/
Energy Source	- Output, acc. to 62368-1		ES1
Power Source	- Output, acc. to 62368-1		PS2
Pollution Degree			PD 3
Over Voltage Category			Not mains connected

EMC Specifications

EMI (Emissions)	- Conducted Emissions		EN 55032 class A (with external 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/thl30wi-emc-filter/
EMS (Immunity)			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, ±2 kV, perf. criteria A
		External filter proposal:	www.tracopower.com/thl30wi-emc-filter/
	- 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
		1 s:	EN 61000-4-8, 1000 A/m, perf. criteria A
EMC / Environmental	- Certification Documents		www.tracopower.com/thl30wi-emc-cert/

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	–40°C to +80°C –40°C to +85°C (with heatsink THL-HS1)
	- Case Temperature	+105°C max.
	- Storage Temperature	–55°C to +125°C

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

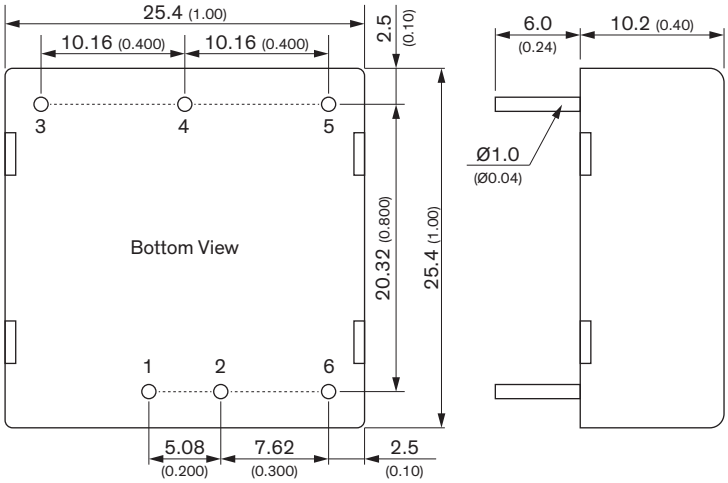
Power Derating	- High Temperature	2.6 %/K above 65°C (average) 3.0 %/K above 70°C (average) (with heatsink THL-HS1) See application note: www.tracopower.com/thl30wi-cc/
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on)	On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current	2 mA typ.
	- Remote Pin Input Current	-0.5 to 0.5 mA
Altitude During Operation		6'000 m max.
Regulator Topology		Flyback Converter
Switching Frequency		158 - 193 kHz (PWM) (3.3 Vout models) 223 - 273 kHz (PWM) (5 Vout models) 257 - 314 kHz (PWM) (other output models)
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	1'310'710 h (MIL-HDBK-217F, ground benign)
Washing Process		According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Environment	- Vibration	IEC 60068-2-64 2.4 g, 3 axis, random waveform, 30 min
	- Mechanical Shock	IEC 60068-2-27 30 g, 3 axis, half sine, 11 ms
	- Thermal Shock	IPC-9592B -40 to +125°C, 100 cycles, 30 min each
Housing Material		Plastic base-plate w. metal case
Base Material		Non-conductive FR4 (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Copper
Pin Foundation Plating		Nickel (2 - 4 µm)
Pin Surface Plating		Tin (3 - 5 µm), matte
Housing Type		Metal Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		1" x 1"
Soldering Profile		Lead-Free Wave Soldering 260°C / 10 s max.
Weight		25 g
Thermal Impedance	- Case to Ambient	11.0 K/W typ. 10.0 K/W typ. (with heatsink THL-HS1)
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: 7(a) (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	4857a92c-ac23-447a-b527-3f0812941172

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

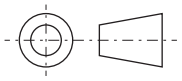
Additional Information

Supporting Documents	www.tracopower.com/overview/thl30wi
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf
Service Portal	www.tracoserviceportal.com

Outline Dimensions



Dimensions in mm (inch)
Tolerances: x.x ±0.5 (x.xx ±0.02)
x.xx ± 0.25 (x.xxx ±0.010)
Pin tolerances: x.x ±0.05 (x.xx ±0.002)



Pinout		
Pin	**Single**	**Dual**
1	+Vin	+Vin
2	–Vin	–Vin
3	+Vout	+Vout
4	Trim	Common
5	–Vout	–Vout
6	Remote On/Off	Remot On/Off

Avoid routing PCB traces under the converter.

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