TRACO POWER

DC/DC Converter — THN 30WI Series, 30 Watt

- **Highest power density 30 W Converter! Ultra compact size: 1.0" x 1.0" x 0.4"**
- **Shielded metal case with isolated baseplate**
- **Ultrawide 4:1 input voltage range**
- **Very high efficiency across full load range up to 92%**
- **Over temperature protection**
- **Operating temp. range: –40°C to +80°C and up to 85°C with heat sink**
- **Ultra low no load input current**
- **Remote On/Off control and output voltage adjustable**
- **I/O isolation voltage 1600 VDC**
- **3-year product warranty**



UL 62368-1 IEC 62368-1

The THN 30WI series is the latest generation of high performance DC/DC converter modules with highest power density. The product achieves 30 W output power while it comes in a metal case with dimensions of only 1.0" x 1.0" x 0.4". All models have an ultra wide 4:1 input voltage range and precisely regulated output voltages, even under no load conditions. Highest efficiency across full load range makes this product very reliable and applicable in temperature ranges of up to 85°C. With a low input current at minimal load and remote On/Off control these converters are the ideal solution for battery-operated systems. 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 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	typ.
THN 30-2410WI	9 - 36 VDC (24 VDC nom.)	3.3 VDC	7'000 mA			88 %
THN 30-2411WI		5 VDC	6'000 mA			89 %
THN 30-2411WI-A1		5 VDC	6'000 mA			88 %
THN 30-2412WI		12 VDC	2'500 mA			89 %
THN 30-2413WI		15 VDC	2'000 mA			89 %
THN 30-2415WI		24 VDC	1'250 mA			90 %
THN 30-2422WI		+12 VDC	1'250 mA	–12 VDC	1'250 mA	89 %
THN 30-2423WI		+15 VDC	1'000 mA	–15 VDC	1'000 mA	91 %
THN 30-2425WI		+24 VDC	625 mA	–24 VDC	625 mA	91 %
THN 30-4810WI	18 - 75 VDC (48 VDC nom.)	3.3 VDC	7'000 mA			88 %
THN 30-4811WI		5 VDC	6'000 mA			90 %
THN 30-4811WI-A1		5 VDC	6'000 mA			89 %
THN 30-4812WI		12 VDC	2'500 mA			90 %
THN 30-4813WI		15 VDC	2'000 mA			91 %
THN 30-4815WI		24 VDC	1'250 mA			92 %
THN 30-4822WI		+12 VDC	1'250 mA	–12 VDC	1'250 mA	91 %
THN 30-4823WI		+15 VDC	1'000 mA	–15 VDC	1'000 mA	92 %
THN 30-4825WI		+24 VDC	625 mA	–24 VDC	625 mA	92 %

Options

Suffix A1	- Adjustable output up to 6VDC, ideal for low Ripple and Noise with an LDO regulator
THN-HS1	- Optional Heat Sink: www.tracopower.com/overview/thn-hs1

Note - ±24 Vout models: The output can also be used in serial circuit for single 48 VDC operation.

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Input Specifications

Input Current	- At no load	24 Vin models:	10 mA typ.
		48 Vin models:	8 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 min. / 8 VDC typ. / 8.8 VDC max.
		48 Vin models:	15.5 VDC min. / 16 VDC typ. / 17.5 VDC max.
Reflected Ripple Current			30 mAp-p typ.
Recommended Input Fuse		24 Vin models:	6'000 mA (slow blow)
		48 Vin 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% to +20% (A1, 15 & 24 Vout models)
			±10% (other models)
			(single output models only)
			(By external trim resistor)
		See application note:	www.tracopower.com/thn30wi-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)
	- 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 typ. (w/ 22 µF, 25 V X7R)
		5 Vout models:	75 mVp-p typ. (w/ 22 µF, 25 V X7R)
		12 Vout models:	75 mVp-p typ. (w/ 2x 22 µF, 25 V X7R)
		15 Vout models:	75 mVp-p typ. (w/ 2x 22 µF, 25 V X7R)
		24 Vout models:	75 mVp-p typ. (w/ 2x 6.8 µF, 50 V X7R)
	- dual output	12 / -12 Vout models:	60 / 60 mVp-p typ. (w/ 10 µF, 25 V X7R)
		15 / -15 Vout models:	60 / 60 mVp-p typ. (w/ 10 µF, 25 V X7R)
		24 / -24 Vout models:	75 / 75 mVp-p typ. (w/ 4.7 µF, 50 V X7R)
Capacitive Load	- single output	3.3 Vout models:	10'000 µF max.
		5 Vout models:	7'200 µF max.
		12 Vout models:	1'200 µF max.
		15 Vout models:	1'000 µF max.
		24 Vout models:	375 µF max.
	- dual output	12 / -12 Vout models:	750 / 750 µF max.
		15 / -15 Vout models:	500 / 500 µF max.
		24 / -24 Vout models:	180 / 180 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			150 - 205% of Iout max.
			170% typ. of Iout max.
Overvoltage Protection			112 - 164% of Vout nom.
Transient Response	- Response Time		250 µs typ. (25% Load Step)

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

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Safety Specifications

Standards	- IT / Multimedia Equipment		EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents		www.tracopower.com/thn30wi-safety-cert
Energy Source	- Output, acc. to 62368-1		ES1
Power Source	- Output, acc. to 62368-1		PS3
Pollution Degree			PD 2
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/thn30wi-emc-filter
EMS (Immunity)	- 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
		Ext. input component:	24 Vin models: 220 µF, 100 V || TVS SMDJ58A 48 Vin models: 220 µF, 100 V
	- 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/thn30wi-emc-cert

General Specifications

Relative Humidity			95% max. (non condensing)
Temperature Ranges	- Operating Temperature		–40°C to +80°C
	- Case Temperature		+105°C max.
	- Storage Temperature		–55°C to +125°C
Power Derating	- High Temperature		Depending on model
		See application note:	www.tracopower.com/thn30wi-cc
Over Temperature Protection Switch Off	- Protection Mode		105°C min. / 130°C typ. / 115°C max. (Automatic recovery at 100°C typ.)
	- Measurement Point		Case
Cooling System			Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on)		On: 3.0 to 15 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 max.
	- Remote Pin Input Current		-0.5 to 1.0 mA
Altitude During Operation			5'000 m max.
Regulator Topology			Flyback Converter
Switching Frequency			275 kHz typ. (PWM) (±10%, 3.3 & 5 Vout model) 330 kHz typ. (PWM) (±10%, other models)
Insulation System			Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s		1'600 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.

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Isolation Capacitance	- Input to Output, 100 kHz, 1 V	1'500 pF max.
Reliability	- Calculated MTBF	1'200'000 h (MIL-HDBK-217F, ground benign)
Washing Process		According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Environment	- Vibration	MIL-STD-810F
	- Thermal Shock	MIL-STD-810F
Housing Material		Copper
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 - 3 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 265°C / 10 s max.
Weight		16.5 g
Thermal Impedance	- Case to Ambient	15.0 K/W typ. 13.8 K/W typ. (with heatsink THN-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	cf64aee3-ac08-489f-a984-7edb8d4d57c4

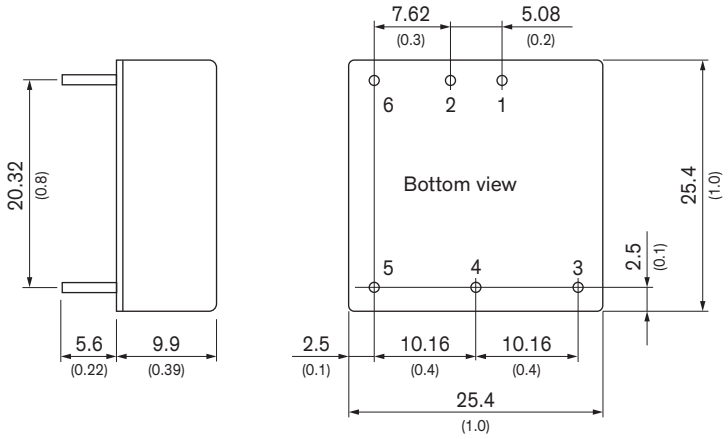
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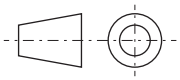
Supporting Documents	www.tracopower.com/overview/thn30wi
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf

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Outline Dimensions





Dimensions in mm (inch)
Tolerances: ±0.5 (±0.02)
Pin pitch tolerances ±0.25 (±0.01)
Pin diameter Ø 1.0 (0.04)

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

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