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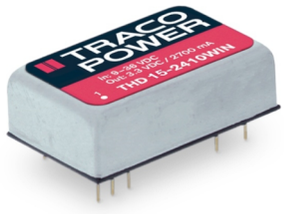
TRACO POWER

DC/DC Converter

THD 15WIN Series, 15 Watt

- **Highest power density in DIP 24 package**
- **Shielded metal case with isolated Baseplate**
- **Very high efficiency up to 90%**
- **Ultra wide 4:1 input ranges**
- **No minimum load required**
- **Input filter meets EN 55022 class A without external components**
- **I/O isolation voltage 1500 VDC**
- **Operating temp. range : –40°C to +85°C**
- **Remote On/Off control**
- **Industry standard pinout**
- **3-year product warranty**



UL 62368-1 IEC 62368-1

The THD 15WIN series models provide 15 Watt output power out of a very compact shielded metal case that occupies only 1 inch² of board space. The converters work with a high efficiency over the full load range and draw a very low input current at no load conditions. All models have a wide 4:1 input voltage range and a precisely regulated output voltage. Typical applications for these converters are mobile equipment, instrumentation, distributed power architectures in communication and industrial electronics and everywhere where space on PCB is critical

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	typ.
THD 15-2410WIN	9 - 36 VDC (24 VDC nom.)	3.3 VDC	4'000 mA			88 %
THD 15-2411WIN		5.1 VDC	3'000 mA			90 %
THD 15-2412WIN		12 VDC	1'250 mA			90 %
THD 15-2413WIN		15 VDC	1'000 mA			90 %
THD 15-2421WIN		+5 VDC	1'500 mA	–5 VDC	1'500 mA	86 %
THD 15-2422WIN		+12 VDC	625 mA	–12 VDC	625 mA	89 %
THD 15-2423WIN		+15 VDC	500 mA	–15 VDC	500 mA	90 %
THD 15-4810WIN	18 - 75 VDC (48 VDC nom.)	3.3 VDC	4'000 mA			89 %
THD 15-4811WIN		5.1 VDC	3'000 mA			89 %
THD 15-4812WIN		12 VDC	1'250 mA			90 %
THD 15-4813WIN		15 VDC	1'000 mA			90 %
THD 15-4821WIN		+5 VDC	1'500 mA	–5 VDC	1'500 mA	86 %
THD 15-4822WIN		+12 VDC	625 mA	–12 VDC	625 mA	89 %
THD 15-4823WIN		+15 VDC	500 mA	–15 VDC	500 mA	90 %

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Input Specifications

Input Current	- At no load	24 Vin models:	6 mA typ.
		48 Vin models:	4 mA typ.
	- At full load	24 Vin models:	740 mA max.
		48 Vin models:	370 mA max.
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 VDC min. / 8 VDC typ. / 8.8 VDC max.
		48 Vin models:	15 VDC min. / 16 VDC typ. / 17.5 VDC max.
Reflected Ripple Current			20 mAp-p typ.
Recommended Input Fuse		24 Vin models:	3'150 mA (slow blow)
		48 Vin models:	1'600 mA (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal Pi-Type

Output Specifications

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.
		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		60 mVp-p typ. (w/ 1 µF, 25 V, X7R, MLCC)
Capacitive Load	- single output	3.3 Vout models:	4'700 µF max.
		5.1 Vout models:	3'300 µF max.
		12 Vout models:	600 µF max.
		15 Vout models:	400 µF max.
	- dual output	5 / -5 Vout models:	1'500 / 1'500 µF max.
		12 / -12 Vout models:	288 / 288 µF max.
		15 / -15 Vout models:	200 / 200 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			60 ms max. (Power On)
			60 ms max. (Remote On)
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			150% typ. of Iout max.
Overvoltage Protection			118 - 125% of Vout nom. (depending on model)
			3.9 VDC typ. (3.3 Vout models)
			6.2 VDC typ. (5.1 Vout models)
			15 VDC typ. (12 Vout models)
			18 VDC typ. (15 Vout models)
Transient Response	- Response Deviation		9% max. (25% Load Step)
	- Response Time		250 µs typ. (25% Load Step)

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/thd15win-safety-cert/
Energy Source	- Output, acc. to 62368-1	ES1

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

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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 (internal filter)
			EN 55032 class B (with external filter)
			FCC 47 Part 15 class A (internal filter)
	- Radiated Emissions		EN 55032 class A (internal filter)
			EN 55032 class B (with external filter)
			FCC 47 Part 15 class A (internal filter)
		External filter proposal:	www.tracopower.com/thd15win-emc-filter/
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, ±2 kV, perf. criteria A
		Ext. input component:	Nippon chemi-con KY 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

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	–40°C to +85°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/thd15win-cc/
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on)	On: 3.0 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	2.5 mA typ.
	- Remote Pin Input Current	-0.5 to 0.5 mA
Altitude During Operation		5'000 m max.
Switching Frequency		297 - 363 kHz (PWM)
		330 kHz typ. (PWM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	1'600 VDC
	- Input to Case, 60 s	1'600 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	2'000 pF typ.
Reliability	- Calculated MTBF	1'600'000 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, Nickel plated
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

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

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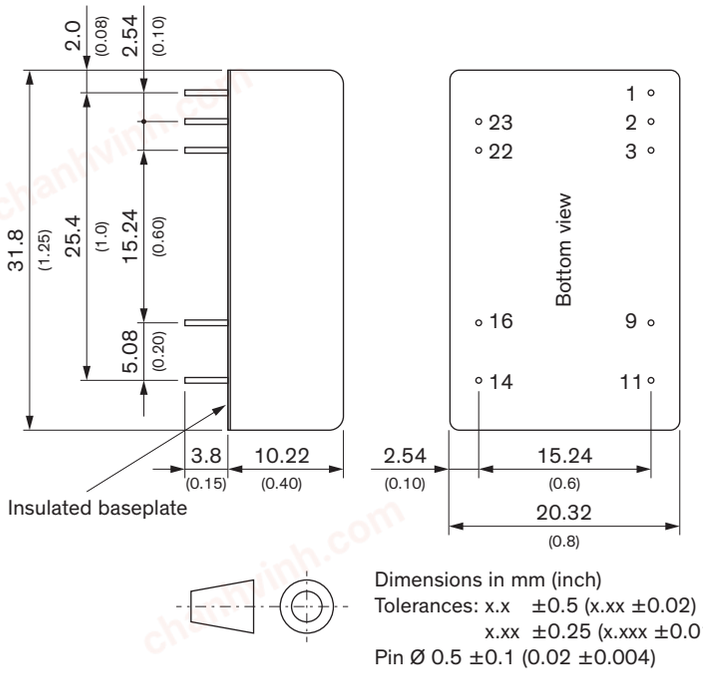
Housing Type		Metal Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		DIP24
Soldering Profile		Lead-Free Wave Soldering 265°C / 10 s max.
Weight		16.2 g
Thermal Impedance	- Case to Ambient	20.0 K/W typ.
Environmental Compliance	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf
		REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf
		Exemptions: 7(a), 7(c)-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	06cb34b5-39a6-40be-b7bd-92df1c5e06e1

Additional Information

Supporting Documents	www.tracopower.com/overview/thd15win
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 ±0.01)
Pin Ø 0.5 ±0.1 (0.02 ±0.004)

Pinout

Pin	Single	Dual
1	Remote On/Off	Remote On/Off
2	–Vin (GND)	–Vin (GND)
3	–Vin (GND)	–Vin (GND)
9	NC	Common
11	NC	–Vout
14	+Vout	+Vout
16	–Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

NC: Not connected

Avoid routing PCB traces under the converter.

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