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TRACO POWER

DC/DC Converter

THD 10WIN Series, 10 Watt

- **Ultra wide 4:1 input voltage range**
- **Internal EMI-filter meets EN 55032, Class A without external components**
- **High efficiency up to 87%**
- **Operating temperature range −40°C to +85°C**
- **I/O isolation 1’500 VDC**
- **Overload protection**
- **3-year product warranty**



UL 62368-1 IEC 62368-1

The THD 10WIN series is designed for an optimized cost/performance ratio of DC/DC converters with output power of 10 Watt. They come with an internal EMI-filter to meet EN 55032, class A without external components. General features like no minimum load requirement, overload protection and high efficiency make these converters easy to design in. With the popular DIP-24 standard package they are also a drop in replacement for many cost critical applications.

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	typ.
THD 10-2410WIN	9 - 36 VDC (24 VDC nom.)	3.3 VDC	2'700 mA			86 %
THD 10-2411WIN		5.1 VDC	2'000 mA			85 %
THD 10-2412WIN		12 VDC	833 mA			87 %
THD 10-2413WIN		15 VDC	666 mA			87 %
THD 10-2415WIN		24 VDC	416 mA			87 %
THD 10-2422WIN		+12 VDC	416 mA	−12 VDC	416 mA	87 %
THD 10-2423WIN		+15 VDC	333 mA	−15 VDC	333 mA	87 %
THD 10-4810WIN	18 - 75 VDC (48 VDC nom.)	3.3 VDC	2'700 mA			86 %
THD 10-4811WIN		5.1 VDC	2'000 mA			85 %
THD 10-4812WIN		12 VDC	833 mA			87 %
THD 10-4813WIN		15 VDC	666 mA			87 %
THD 10-4815WIN		24 VDC	416 mA			87 %
THD 10-4822WIN		+12 VDC	416 mA	−12 VDC	416 mA	87 %
THD 10-4823WIN		+15 VDC	333 mA	−15 VDC	333 mA	87 %

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Input Specifications

Input Current	- At no load	24 Vin models:	30 mA typ.
		48 Vin models:	20 mA typ.
	- At full load	24 Vin models:	470 mA typ.
		48 Vin models:	240 mA typ.
Surge Voltage		24 Vin models:	50 VDC max. (1 s max.)
		48 Vin models:	100 VDC max. (1 s max.)
Start-up Voltage		24 Vin models:	7 VDC min. / 8 VDC typ. / 9 VDC max.
		48 Vin models:	14 VDC min. / 16 VDC typ. / 18 VDC max.
Under Voltage Lockout		24 Vin models:	8.5 VDC max.
		48 Vin models:	17 VDC max.
Reflected Ripple Current		24 Vin models:	40 mAp-p typ.
		48 Vin models:	30 mAp-p typ.
Recommended Input Fuse		24 Vin models:	2'000 mA (slow blow)
		48 Vin models:	1'000 mA (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal Pi-Type

Output Specifications

Voltage Set Accuracy			±2% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models:	1% max.
		dual output models:	1% max.
	- Load Variation (0 - 100%)	single output models:	1.2% max.
		dual output models:	1.2% max. (Output 1)
			1.2% max. (Output 2)
	- Voltage Balance (symmetrical load)	dual output models:	2% max.
Ripple and Noise	- 20 MHz Bandwidth		100 mVp-p max.
Capacitive Load	- single output	3.3 Vout models:	1'000 µF max.
		5.1 Vout models:	1'000 µF max.
		12 Vout models:	470 µF max.
		15 Vout models:	330 µF max.
		24 Vout models:	150 µF max.
	- dual output	12 / -12 Vout models:	220 / 220 µF max.
		15 / -15 Vout models:	150 / 150 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			150% typ. of Iout max.
Transient Response	- Response Deviation		3% typ. / 5% max. (75% to 100% Load Step)
	- Response Time		300 µs typ. / 600 µs max. (75% to 100% Load Step)

Safety Specifications

Standards	- IT / Multimedia Equipment	CSA-C22.2, No. 60950-1
		EN 60950-1
		EN 62368-1
		IEC 60950-1
		IEC 62368-1
		UL 60950-1
		UL 62368-1
	- Certification Documents	www.tracopower.com/thd10win-safety-cert/
Energy Source	- Output, acc. to 62368-1	ES1
Power Source	- Output, acc. to 62368-1	PS3

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

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Pollution Degree		PD 2
Over Voltage Category		Not mains connected

EMC Specifications

EMI (Emissions)	- Conducted Emissions		EN 55032 class A (internal 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, ±1 kV, perf. criteria A
		Ext. input component:	220 µF, 100 V
	- Conducted RF Disturbances		EN 61000-4-6, 10 Vrms, 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		–50°C to +125°C
Power Derating	- High Temperature		2.86 %/K above 70°C
		See application note:	www.tracopower.com/thd10win-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		10 mA max.
	- Remote Pin Input Current		-0.5 to 0.5 mA
Altitude During Operation			6'000 m max.
Switching Frequency			300 - 360 kHz (PWM) 330 kHz typ. (PWM)
Insulation System			Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s		1'500 VDC
Isolation Resistance	- Input to Output, 500 VDC		1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V		1'000 pF typ. 1'500 pF max.
Reliability	- Calculated MTBF		1'000'000 h (MIL-HDBK-217F, ground benign)
Washing Process			According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Housing Material			Metal
Base Material			Non-conductive Plastic (UL 94 V-0 rated)
Potting Material			Silicone (UL 94 V-0 rated)
Pin Material			Copper Alloy (C6801)
Pin Foundation Plating			Nickel (2.5 µm min.)
Pin Surface Plating			Gold (75 - 125 nm), glossy
Housing Type			Metal Case
Mounting Type			PCB Mount
Connection Type			THD (Through-Hole Device)
Footprint Type			DIP24
Soldering Profile			Lead-Free Wave Soldering 260°C / 10 s max.
Weight			17.3 g

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

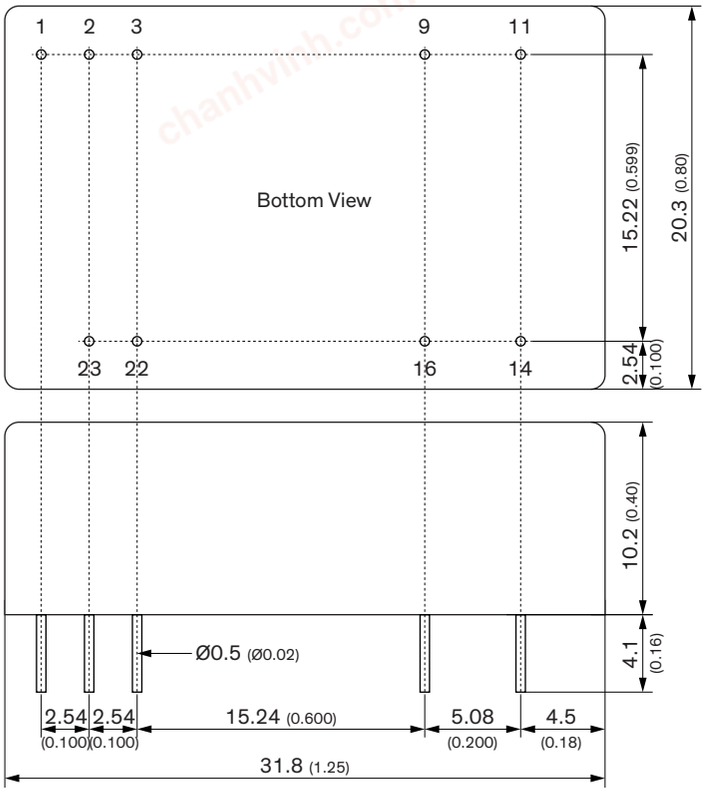
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Environmental Compliance	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf
		REACH SVHC list compliant
		REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf
		Exemptions: 7(a)
		(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	b791aa3f-0104-4139-9ff5-537e1ec921bd

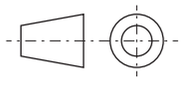
Additional Information

Supporting Documents	www.tracopower.com/overview/thd10win
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 ±0.50 (x.xx ±0.02)
Tolerances: x.xx ±0.25 (x.xxx ±0.01)
Pin diameter tolerance: x.x ±0.05 (x.xx ±0.002)



Pinout		
Pin	**Single**	**Dual**
1	Remote On/Off	Remote On/Off
2	–Vin (GND)	–Vin (GND)
3	–Vin (GND)	–Vin (GND)
9	No pin	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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