THE DATASHEET OF

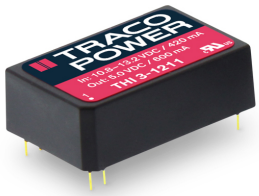
THI 3-1213

TRACO POWER

DC/DC Converter

THI 3 Series, 3 Watt

- **Standard DIP-24 Package**
- **I/O isolation 4000 VACrms rated for 300 VACrms working voltage**
- **2 x MOOP Medical safety according to AAMI/ANSI ES 60601-1:2005(R) and IEC/EN 60601-1 3rd edition**
- **Industrial safety to IEC/EN/UL 62368-1**
- **Operating temperature range -40°C to 75°C**
- **Fully regulated output voltage**
- **Input filter meets EN 55032, class A**
- **Short circuit protection**
- **3-year product warranty**



ES 60601-1 IEC 60601-1
UL 62368-1 IEC 62368-1

The THI 3 series is a new range of high isolation DC/DC converters with a reinforced insulation system. The I/O- isolation voltage is specified for 4000 VACrms. The circuit is encapsulated in a DIP-24 package. There are 15 models available for 5, 12 and 24 VDC input voltage and single or dual output voltage. The THI 3 DC/DC converters offer a cost effective solution for applications in industrial controls and medical instrumentation requiring a certified supplementary or reinforced insulation system to comply with industrial or latest medical safety standards.

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	typ.
THI 3-0511	4.5 - 5.5 VDC (5 VDC nom.)	5 VDC	600 mA			60 %
THI 3-0512		12 VDC	250 mA			62 %
THI 3-0513		15 VDC	200 mA			62 %
THI 3-0522		+12 VDC	125 mA	−12 VDC	125 mA	60 %
THI 3-0523		+15 VDC	100 mA	−15 VDC	100 mA	60 %
THI 3-1211	10.8 - 13.2 VDC (12 VDC nom.)	5 VDC	600 mA			60 %
THI 3-1212		12 VDC	250 mA			62 %
THI 3-1213		15 VDC	200 mA			62 %
THI 3-1222		+12 VDC	125 mA	−12 VDC	125 mA	60 %
THI 3-1223		+15 VDC	100 mA	−15 VDC	100 mA	60 %
THI 3-2411	21.6 - 26.4 VDC (24 VDC nom.)	5 VDC	600 mA			60 %
THI 3-2412		12 VDC	250 mA			64 %
THI 3-2413		15 VDC	200 mA			64 %
THI 3-2422		+12 VDC	125 mA	−12 VDC	125 mA	60 %
THI 3-2423		+15 VDC	100 mA	−15 VDC	100 mA	60 %

Input Specifications

Input Current	- At no load	5 Vin models:	130 mA typ.
		12 Vin models:	60 mA typ.
		24 Vin models:	40 mA typ.
	- At full load	5 Vin models:	1'000 mA typ.
		12 Vin models:	420 mA typ.
		24 Vin models:	210 mA typ.
Surge Voltage		5 Vin models:	7.5 VDC max. (1 s max.)
		12 Vin models:	15 VDC max. (1 s max.)
		24 Vin models:	30 VDC max. (1 s max.)
Recommended Input Fuse		5 Vin models:	2'000 mA (slow blow)
		12 Vin models:	1'000 mA (slow blow)
		24 Vin models:	500 mA (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal Pi-Type
Short Circuit Input Power			2.5 W max.

Output Specifications

Voltage Set Accuracy			±4% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models:	0.5% max.
		dual output models:	0.5% max.
	- Load Variation (10 - 100%)	single output models:	1% max.
		dual output models:	1% max. (Output 1)
			1% max. (Output 2)
	- Voltage Balance (symmetrical load)	dual output models:	4% max.
Ripple and Noise	- 20 MHz Bandwidth		50 mVp-p max.
			(To further reduce Ripple and Noise, a capacitor with 1.5 µF X7R is recommended.)
Capacitive Load	- single output	5 Vout models:	470 µF max.
		12 Vout models:	470 µF max.
		15 Vout models:	470 µF max.
	- dual output	12 / -12 Vout models:	220 / 220 µF max.
		15 / -15 Vout models:	220 / 220 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			18 ms max.
Short Circuit Protection			Continuous, Automatic recovery

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
	- Medical Equipment	EN 60601-1
		IEC 60601-1
		ANSI/AAMI ES 60601-1
		CSA-C22.2, No 60601-1
		2 x MOOP (Means Of Operator Protection)
	- Certification Documents	www.tracopower.com/overview/thi3
Pollution Degree		PD 2
Over Voltage Category		OVC II

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

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55032 class A (internal filter)
	- Radiated Emissions	EN 55032 class A (internal filter)

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	–40°C to +75°C
	- Case Temperature	+95°C max.
	- Storage Temperature	–50°C to +125°C
Power Derating	- High Temperature	2.85 %/K above 60°C
	See application note:	www.tracopower.com/overview/thi3
Cooling System		Natural convection (20 LFM)
Altitude During Operation		4'000 m max. (acc. to IEC/EN/UL 60601-1) 5'000 m max. (acc. to IEC/EN/UL 62368-1)
Regulator Topology		Push-Pull Converter
Switching Frequency		25 - 75 kHz (PFM) 60 kHz typ. (PFM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		300 VAC
Isolation Test Voltage	- Input to Output, 60 s	4'000 VAC (acc. to IEC/EN 60601-1) 3'000 VAC (acc. to IEC/EN/UL 62368-1)
Isolation Resistance	- Input to Output, 500 VDC	10'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	20 pF typ.
Leakage Current	- Touch Current	2 µA max. (240 VAC, 60 Hz)
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		Plastic resin (UL 94 V-0 rated)
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		Plastic 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		12.4 g
Thermal Impedance	- Case to Ambient	16.3 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: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	e5360cbc-6a16-41f4-a0c1-106f7a68dd67

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/thi3

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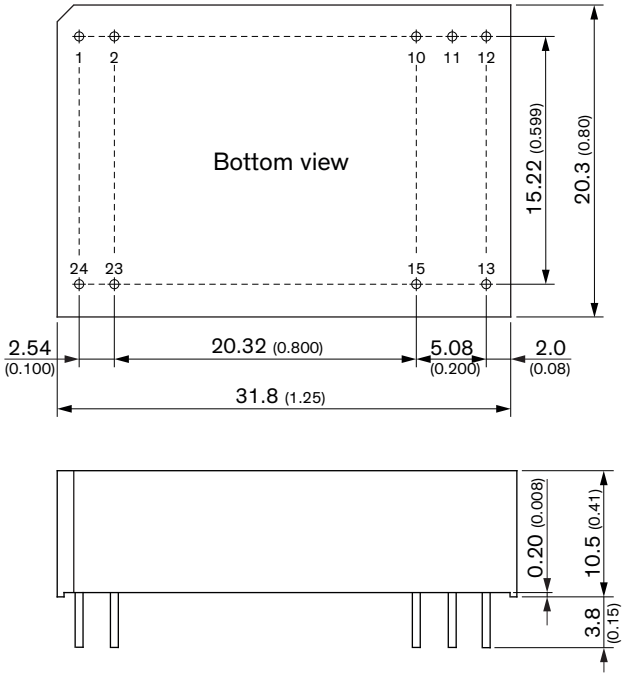
Outline Dimensions



Dimensions in mm (inch)
Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
Tolerance: x.x ±0.25 (x.xx ±0.01)
x.xx ±0.13 (x.xxx ±0.005)

Pinout		
Pin	**Single**	**Dual**
1	+Vin (Vcc)	
2	+Vin (Vcc)	
10	No pin	Common
11	No pin	Common
12	–Vout	No pin
13	+Vout	–Vout
15	No pin	+Vout
23	–Vin (GND)	
24	–Vin (GND)	

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

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