

Features

- ◆ Supplementary and reinforced insulation
- ◆ 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 60950-1
- ◆ Fully regulated output voltage
- ◆ Input filter meets EN 55022, class A and FCC, level A
- ◆ Operating temp. range -40°C to +75°C
- ◆ Low leakage current
- ◆ Low coupling capacitance
- ◆ Short circuit protection
- ◆ 3-years product warranty



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 4000VACrms. The circuit is encapsulated in a DIP-24 package.

There are 15 models available for 5, 12 and 24VDC 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 voltage	Output current max.	Efficiency typ.
THI 3-0511	5.0 VDC $\pm$ 10%	5 VDC	600 mA	60 %
THI 3-0512		12 VDC	250 mA	62 %
THI 3-0513		15 VDC	200 mA	62 %
THI 3-0522		$\pm$ 12 VDC	$\pm$ 125 mA	60 %
THI 3-0523		$\pm$ 15 VDC	$\pm$ 100mA	60 %
THI 3-1211	12.0 VDC $\pm$ 10%	5 VDC	600 mA	60 %
THI 3-1212		12 VDC	250 mA	62 %
THI 3-1213		15 VDC	200 mA	62 %
THI 3-1222		$\pm$ 12 VDC	$\pm$ 125 mA	60 %
THI 3-1223		$\pm$ 15 VDC	$\pm$ 100 mA	60 %
THI 3-2411	24 VDC $\pm$ 10%	5 VDC	600 mA	60 %
THI 3-2412		12 VDC	250 mA	64 %
THI 3-2413		15 VDC	200 mA	64 %
THI 3-2422		$\pm$ 12 VDC	$\pm$ 125 mA	60 %
THI 3-2423		$\pm$ 15 VDC	$\pm$ 100 mA	60 %

Input Specifications

Input current no load / full load	5 Vin models: 130 mA / 1000 mA typ. 12 Vin models: 60 mA / 420 mA typ. 24 Vin models: 40 mA / 210 mA typ.
Surge voltage (1 sec. max.)	5 Vin models: 7.5 V max. 12 Vin models: 15 V max. 24 Vin models: 30 V max.
Recommended input fuse (slow blow)	5 Vin models: 2 A 12 Vin models: 1 A 24 Vin models: 0.5 A
Input filter	Pi-Filter
Conducted noise	EN 55022, class A and FCC level A

Output Specifications

Voltage set accuracy	±4 %
Voltage balance (dual output models)	4 % max.
Regulation	– Input variation 0.5 % – Load variation 10–100% 1.0 % max.
Min. load	no minimum load required
Ripple and noise (20 MHz Bandwidth)	50 mVpk-pk max.
Temperature coefficient	±0.02 %/K
Short circuit protection	continuous (automatic recovery)
Capacitive load	single output models: 470 µF max. dual output models: 220 µF max. (each output)

Isolation / Safety Standards

I/O isolation voltage (50Hz, 60sec.)	– to meet ES/IEC/EN 60601-1	4000 VACrms, rated for 300 Vrms working voltage, 2 x MOOP
Isolation capacitance	– Input/Output	20 pF typ.
Isolation resistance	– Input/Output	>10 Gohm (at 500 VDC)
Pri-Sec leakage current (at 240VAC, 60Hz)		2 µA
Safety standards		IEC/EN 60950-1, IEC/EN 60601-1 3rd Edition, ANSI/AAMI ES60601-1 and CAN/CSA-C22.2 No. 60601-1, Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance
Safety approvals	– CB test certificate according IEC 60950-1 – CB test certificate according IEC 60601-1 – UL online certification to ES 60601-1	www.tracopower.com/products/thi3-cb60950.pdf www.tracopower.com/products/thi3-cb60601.pdf www.ul.com/database File: e188913 - QQHM2

General Specifications

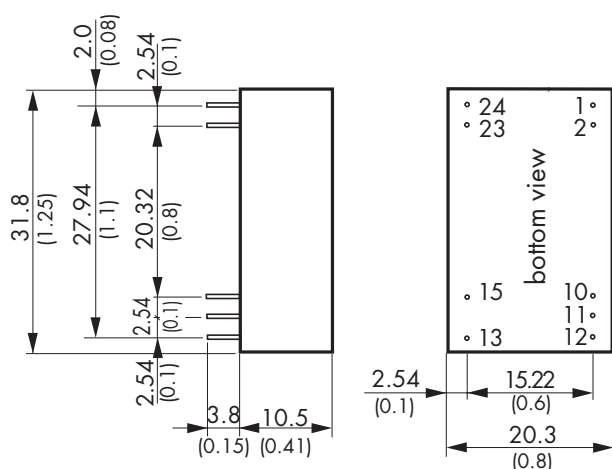
Temperature ranges	– Operating – Case temperature – Storage	–40°C to +75°C +95°C max. –50°C to +125°C
Derating		2.78 %/K above 60°C
Humidity (non condensing)		95 % rel. H max.
Altitude during operation		4000 m
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>1 Mio h
Switching frequency		25 – 60 kHz (PFM)

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

General Specifications

Environmental compliance	– Reach – RoHS	www.tracopower.com/products/thi3-reach.pdf RoHS directive 2011/65/EU
Casing material	plastic (UL 94V-0 rated)	
Pin Material	Copper Alloy with gold plated Nickel over subplate	
Weight	12.4 g (0.44 oz)	
Soldering temperature	max. 260°C / 10 sec	

Outline Dimensions



Pin-Out

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

Dimensions in [mm], () = Inch
Tolerances: ± 0.25 (± 0.01)
Pin diameter: $\varnothing 0.5 \pm 0.05$ (0.02 ± 0.002)
Pin pitch tolerances: ± 0.13 (± 0.005)