DC/DC Converters

THI 2M Series, 2 Watt

CB Scheme

c SA us

UL 60950-1
UL 60601-1

Features

- Ultracompact DIP 16 package
- I/O isolation 4000 VACrms
- Reinforced insulation rated for working voltage up to 300 VAC
- Industrial & medical safety approval
- Operating temp. range –25 °C to +71 °C
- Short circuit protection

The THI 2M series is a new range of ultra-compact 2W DC/DC-converters providing a high I/O-isolation voltage of 4000 VAC. With a reinforced I/O-isolation system this product is an economical solution for many applications in instrumentation, industrial controls, medical equipment and everywhere where supplementary- or reinforced insulation is required to meet requested safety standards.
Full SMD-design with exclusive use of ceramic capacitors ensure a very high reliability and a long product lifetime.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
THI 2-0511M	**5.0 VDC ± 10%** (nominal 5 VDC)	5 VDC	400 mA	66 %
THI 2-0512M		12 VDC	165 mA	66 %
THI 2-0513M		15 VDC	133 mA	66 %
THI 2-0522M		± 12 VDC	± 83 mA	72 %
THI 2-0523M		± 15 VDC	± 66 mA	73 %
THI 2-1211M	**12.0 VDC ± 10%** (nominal 12 VDC)	5 VDC	400 mA	66 %
THI 2-1212M		12 VDC	165 mA	66 %
THI 2-1213M		15 VDC	133 mA	66 %
THI 2-1222M		± 12 VDC	± 83 mA	74 %
THI 2-1223M		± 15 VDC	± 66 mA	75 %
THI 2-2411M	**24 VDC ± 10%** (nominal 24 VDC)	5 VDC	400 mA	66 %
THI 2-2412M		12 VDC	165 mA	66 %
THI 2-2413M		15 VDC	133 mA	66 %
THI 2-2422M		± 12 VDC	± 83 mA	74 %
THI 2-2423M		± 15 VDC	± 66 mA	75 %

Input Specifications

Input current no load /full load	5 Vin models: 12 Vin models: 24 Vin models:	60 mA / 600 mA typ. 30 mA / 250 mA typ. 15 mA / 125 mA typ.
Reverse voltage protection		0.3 A max.
Recommanded input fuse (slow blow)	5 Vin models: 12 Vin models: 24 Vin models:	1.0 A 0.5 A 0.2 A
Surge voltage (1 sec. max.)	5 Vin models: 12 Vin models: 24 Vin models:	9 V max. 18 V max. 30 V max.
Input filter		internal capacitors

Output Specifications

Voltage set accuracy		± 4 %
Voltage balance (dual output models)		1 % max.
Regulation	– Input variation – Load variation 20 – 100 %	1.2 % / 1 % change of Vin 10 % max. 12 % max. for 5 Vout models.
Ripple and noise (20 MHz Bandwidth)		150 mVpk-pk max
Temperature coefficient		± 0.02 %/K
Short circuit protection		0.5 sec. max.
Minimum load		2 % of rated max. current
Capacitive load	single output models: dual output models:	330 µF max. 100 µF max. (each output)

General Specifications

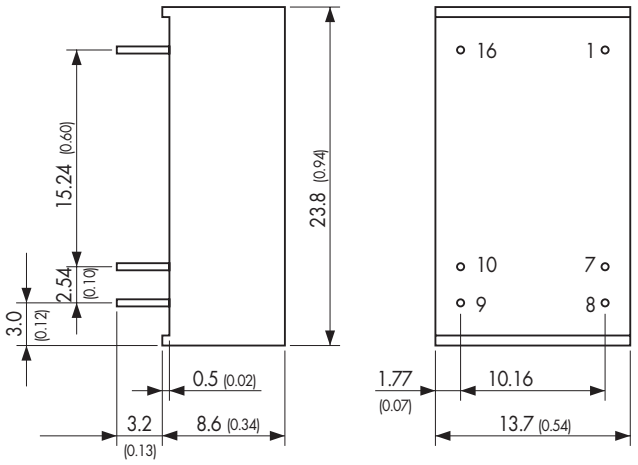
Temperature ranges	– Operating – Storage – Case	– 25 °C to + 75 °C – 55 °C to + 125 °C + 110 °C max.
Derating		2.5 %/K above 60 °C
Humidity (non condensing)		95 % rel. H max.
Reliability, calculated MTBF (MIL-HDBK-217F gound benign)		>2.0 Mio h @ 25 °C
Isolation voltage (50Hz, 60sec) – Input/Output		4'000 VACrms
Isolation test voltage (1 sec.)		6'000 Vpk
Leakage current (at 240VAC, 60Hz)		2 µA max.
Isolation capacity	– Input/Output	20 pF max. (at 100KHz, 1V)
Isolation resistance	– Input/Output	>10 Gohm (at 500VDC)
Switching frequency		50 – 100 kHz (PFM)
Safety standards		IEC/EN 60950-1, UL 60950-1 CSA C22.2 No. 60950-1-03 IEC/EN 60601-1, UL 60601-1, CSA C22.2 No. 601-1
Safety approvals	– CSA certificate for medical electrical equipment for information technology equipment – CB test report for medical electrical equipment for information technology equipment	www.tracopower.com/products/tsp-csa60601.pdf www.tracopower.com/products/tsp-csa60950.pdf www.tracopower.com/products/tsp-cb60601.pdf www.tracopower.com/products/tsp-cb60950.pdf

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

General Specifications

Case material	plastic
Weight	5.1 g (0.18oz)
Soldering temperature	max. 265 °C / 10 sec

Outline Dimensions



Pin-Out		
Pin	**Single**	**Dual**
1	–Vin (GND)	–Vin (GND)
7	No con.	No con.
8	No con.	Common
9	+Vout	+Vout
10	–Vout	–Vout
16	+Vin	+Vin

Dimensions in [mm], () = Inch
Pin diameter ø 0.5 ±0.05 (0.024 ±0.002)
Tolerances ±0.25 (0.01)
Pin pich tolerances ±0.05 (0.002)

Specifications can be changed any time without notice.

TRACO ELECTRONIC AG
Jenatschstrasse 1 · CH-8002 Zurich · Switzerland
Tel. +41 43 311 45 11 · Fax +41 43 311 45 45 · info@traco.ch · www.tracopower.com