

TMH Series

DC/DC Converters · 2 Watt

Features

- Single-in-line package (SIP)
- Fully SMD-design
- Isolated single and dual output
- I/O isolation 1'000 VDC
- Unregulated device
- High efficiency up to 83 %
- Industry standard pinout
- 100% burn-in (8 h)
- Lead free design, RoHS compliant
- 3-year product warranty



Description

The TMH series are ultra miniature, isolated 2 Watt DC/DC-converters in a Single-in-Line package (SIP). Requiring only 1.5 cm² board space they offer the ideal solution in many space critical applications for board level power distribution. The use of SMD-technology makes it possible to offer a product with high performance at low cost.

Models

Ordercode	Input voltage	Output voltage	Output current max.	Efficiency typ.
TMH 0505S	5 VDC		400 mA	76 %
TMH 0512S		12 VDC	165 mA	80 %
TMH 0515S	5 VDC ±10%	15 VDC	133 mA	80 %
TMH 0505D		±5 VDC	±200 mA	77 %
TMH 0512D		±12 VDC	±83 mA	79 %
TMH 0515D		±15 VDC	±66 mA	79 %
TMH 1205S	12 VDC	5 VDC	400 mA	78 %

Ordercode	Input voltage	Output voltage	Output current max.	Efficiency typ.
TMH 1212S		12 VDC	165 mA	82 %
TMH 1215S	12 VDC $\pm 10\%$	15 VDC	133 mA	83 %
TMH 1205D		± 5 VDC	± 200 mA	79 %
TMH 1212D		± 12 VDC	± 83 mA	82 %
TMH 1215D		± 15 VDC	± 66 mA	82 %
TMH 2405S	24 VDC	5 VDC	400 mA	77 %
TMH 2412S		12 VDC	165 mA	81 %
TMH 2415S	24 VDC $\pm 10\%$	15 VDC	133 mA	82 %
TMH 2405D		± 5 VDC	± 200 mA	79 %
TMH 2412D		± 12 VDC	± 83 mA	81 %
TMH 2415D		± 15 VDC	± 66 mA	82 %

Specification

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

Input Specifications

Input current no load / full load: 5 Vin models: 60 mA / 510 mA typ.; 12 Vin models: 30 mA / 200 mA typ.; 24 Vin models: 15 mA / 100 mA typ.

Surge voltage (1 s max.): 5 Vin models: 9 V max.; 12 Vin models: 18 V max.; 24 Vin models: 30 V max.

Reverse voltage protection: 0.3 A max.

Reflected input ripple current: can be reduced by ext. 1 – 3.3 μ F polyester film capacitor

Input filter: internal capacitors

Output Specifications

Voltage set accuracy: ± 1 % typ. / ± 3 % max.

Voltage balance (dual output models, balanced loads): 0.1 % typ. / 1 % max.

Regulation – Input variation (1 % input voltage change): 1.2 % typ. / 1.5 % max.

Regulation – Load variation (20 – 100 %): 5 to 11 % max. (depending on model)

Ripple and noise (20 MHz Bandwidth): 100 mVp-p typ. / 150 mVp-p max.

Temperature coefficient: ± 0.01 %/K typ. / ± 0.02 %/K max.

Short circuit protection: limited 0.5 s max.

Capacitive load – Single output models: 470 μ F max.

Capacitive load – Dual output models: 390 μ F max.

General Specifications

Temperature ranges – Operating: -40°C to $+85^{\circ}\text{C}$

Temperature ranges – Case temperature: $+90^{\circ}\text{C}$ max.

Temperature ranges – Storage: -50°C to $+125^{\circ}\text{C}$

Derating (natural convection): 3 %/K above $+70^{\circ}\text{C}$

Humidity (non condensing): 95 % rel H max.

Reliability, calculated MTBF (MIL-HDBK-217F at $+25^{\circ}\text{C}$, ground benign): $>2'000'000$ h

Isolation voltage (60 s) – Input/Output: 1'000 VDC

Isolation capacitance – Input/Output: 80 pF typ.

Isolation resistance – Input/Output: $>1'000$ Mohm

Switching frequency: 50 to 100 kHz (frequency modulation)

Environmental compliance – Reach

Environmental compliance – RoHS: RoHS directive 2002/95/EC

Physical Specifications

Casing material: non conductive black plastic (UL 94-V0 rated)

Package weight: 2.7 g (0.1oz)

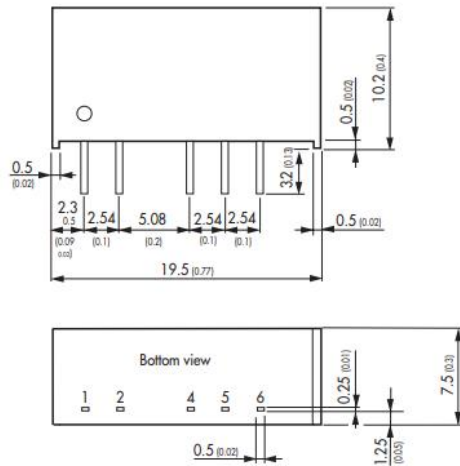
Soldering temperature: max. $+265^{\circ}\text{C}$ / 10 s

Outline Dimensions mm (inches)

Bottom view: 1.25, 2.54, 0.5, 2.3, 0.5, 2.54, 19.5 (0.77), 5.08, 2.54, 7.5 (0.3), 0.5 (0.02), 10.2 (0.4), 3.2 (0.13), 0.5 (0.02), 0.5 (0.02), 0.5 (0.02), 0.09, 0.02, 0.5 (0.02), 0.25 (0.01).

Tolerances: ± 0.25 (± 0.01); pins: ± 0.05 (± 0.002)

Pin-Out



Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	−Vin (GND)	−Vin (GND)
4	−Vout	−Vout
5	No pin	Common
6	+Vout	+Vout

Specifications can be changed without notice! Make sure you are using the latest documentation