THE DATASHEET OF

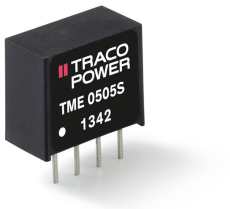
TME 1212S

TRACO POWER

DC/DC Converter

TME Series, 1 Watt

- **Unregulated outputs**
- **I/O isolation voltage 1'000VDC**
- **Efficiency up to 80%**
- **Operating temperature range –40 °C to +85 °C**
- **3-year product warranty**



The TME series is a range of sub-miniature, isolated DC/DC-converters in a SIP-package, which requires only 0.7 cm2 of board space. They provide a cost effective solution to generate supplementary, isolated voltages. Full SMD-design and a 100% production test of parameters ensure a high reliability of this product.

Models

Order Code	Input Voltage Range	Output Voltage nom.	Output Current max.	Efficiency typ.
TME 0303S	2.97 - 3.63 VDC (3.3 VDC nom.)	3.3 VDC	260 mA	74 %
TME 0305S		5 VDC	200 mA	77 %
TME 0503S	4.5 - 5.5 VDC (5 VDC nom.)	3.3 VDC	260 mA	72 %
TME 0505S		5 VDC	200 mA	69 %
TME 0509S		9 VDC	110 mA	76 %
TME 0512S		12 VDC	84 mA	77 %
TME 0515S		15 VDC	67 mA	78 %
TME 1205S	10.8 - 13.2 VDC (12 VDC nom.)	5 VDC	200 mA	71 %
TME 1209S		9 VDC	110 mA	77 %
TME 1212S		12 VDC	84 mA	79 %
TME 1215S		15 VDC	67 mA	80 %
TME 2405S	21.6 - 26.4 VDC (24 VDC nom.)	5 VDC	200 mA	70 %
TME 2409S		9 VDC	110 mA	76 %
TME 2412S		12 VDC	84 mA	79 %
TME 2415S		15 VDC	67 mA	79 %

Input Specifications

Input Current	- At no load	3.3 Vin models:	**35 mA typ.**
		5 Vin models:	**30 mA typ.**
		12 Vin models:	**13 mA typ.**
		24 Vin models:	**7 mA typ.**
	- At full load	3.3 Vin models:	**351 mA typ.** (3.3 Vout model)
			394 mA typ. (5 Vout model)
		5 Vin models:	**238 mA typ.** (3.3 Vout model)
			290 mA typ. (5 Vout model)
			260 mA typ. (9 Vout model)
			262 mA typ. (12 Vout model)
			258 mA typ. (15 Vout model)
		12 Vin models:	**117 mA typ.** (5 Vout model)
			107 mA typ. (9 Vout model)
			106 mA typ. (12 Vout model)
			105 mA typ. (15 Vout model)
		24 Vin models:	**60 mA typ.** (5 Vout model)
			54 mA typ. (9 Vout model)
			53 mA typ. (12 Vout model)
			53 mA typ. (15 Vout model)
Surge Voltage		3.3 Vin models:	**6 VDC max.** (1 s max.)
		5 Vin models:	**9 VDC max.** (1 s max.)
		12 Vin models:	**18 VDC max.** (1 s max.)
		24 Vin models:	**30 VDC max.** (1 s max.)
Recommended Input Fuse		3.3 Vin models:	**750 mA** (slow blow)
		5 Vin models:	**750 mA** (slow blow)
		12 Vin models:	**750 mA** (slow blow)
		24 Vin models:	**750 mA** (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal Capacitor

Output Specifications

Voltage Set Accuracy			±3% max.
Regulation	- Input Variation (1% Vin step)		1.5% max.
	- Load Variation	See application note:	www.tracopower.com/overview/tme
Ripple and Noise	- 20 MHz Bandwidth		150 mVp-p max.
			100 mVp-p typ.
Capacitive Load			33 µF max.
Minimum Load			2.5 % of Iout max.
			(Operation at lower load will not damage the converter, but it may not meet all specifications)
Temperature Coefficient			±0.02 %/K max.
Start-up Time			2.9 ms max.
Short Circuit Protection			Limited 0.5 s max., Automatic recovery

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		3.33 %/K above 70°C (5 Vout models)
			4 %/K above 75°C (other models)
		See application note:	www.tracopower.com/overview/tme
Cooling System			Natural convection (20 LFM)
Regulator Topology			Push-Pull Converter

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

Switching Frequency			50 - 110 kHz (PFM) 90 kHz typ. (PFM)
Insulation System			Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s		1'000 VDC
	- Input to Output, 1 s		1'200 VDC
Isolation Resistance	- Input to Output, 500 VDC		1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V		60 pF typ. 100 pF max.
Reliability	- Calculated MTBF		2'000'000 h (MIL-HDBK-217F, ground benign)
Washing Process			According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Housing Material			Non-conductive Plastic (UL 94 V-0 rated)
Base Material			Non-conductive Plastic (UL 94 V-0 rated)
Potting Material			Epoxy (UL 94 V-0 rated)
Pin Material			Nickel-Iron (Alloy 42)
Pin Foundation Plating			Nickel (1 µm min.)
Pin Surface Plating			Tin (3 - 5 µm), matte
Housing Type			Plastic Case
Mounting Type			PCB Mount
Connection Type			THD (Through-Hole Device)
Footprint Type			SIP4
Soldering Profile			Lead-Free Wave Soldering 260°C / 10 s max.
Weight		3.3 Vin models:	1.3 g
		5 Vin models:	1.3 g
		12 Vin models:	1.3 g
		24 Vin models:	1.7 g
Thermal Impedance	- Case to Ambient		78 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: No Exemptions

Supporting Documents

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

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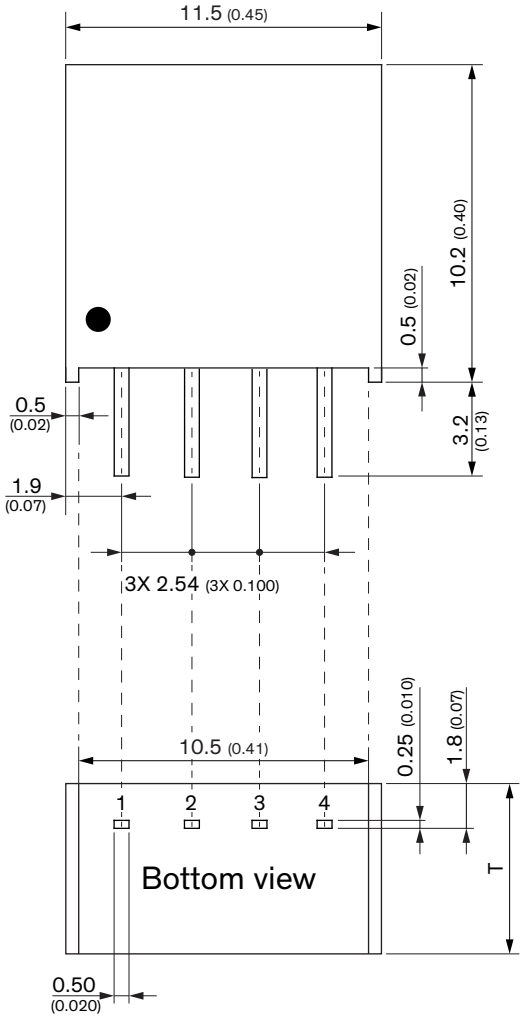
Outline Dimensions



Pinout	
Pin	**Single**
1	–Vin (GND)
2	+Vin (Vcc)
3	–Vout
4	+Vout

T: 6.1 (0.24) for 3.3Vin & 5Vin & 12Vin Models
T: 7.1 (0.28) for 24Vin Models

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

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