

- 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 cm<sup>2</sup> 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: <b>35 mA typ.</b> 5 Vin models: <b>30 mA typ.</b> 12 Vin models: <b>13 mA typ.</b> 24 Vin models: <b>7 mA typ.</b>
	- At full load	3.3 Vin models: <b>351 mA typ.</b> (3.3 Vout model) <b>394 mA typ.</b> (5 Vout model) 5 Vin models: <b>238 mA typ.</b> (3.3 Vout model) <b>290 mA typ.</b> (5 Vout model) <b>260 mA typ.</b> (9 Vout model) <b>262 mA typ.</b> (12 Vout model) <b>258 mA typ.</b> (15 Vout model) 12 Vin models: <b>117 mA typ.</b> (5 Vout model) <b>107 mA typ.</b> (9 Vout model) <b>106 mA typ.</b> (12 Vout model) <b>105 mA typ.</b> (15 Vout model) 24 Vin models: <b>60 mA typ.</b> (5 Vout model) <b>54 mA typ.</b> (9 Vout model) <b>53 mA typ.</b> (12 Vout model) <b>53 mA typ.</b> (15 Vout model)
Surge Voltage		3.3 Vin models: <b>6 VDC max.</b> (1 s max.) 5 Vin models: <b>9 VDC max.</b> (1 s max.) 12 Vin models: <b>18 VDC max.</b> (1 s max.) 24 Vin models: <b>30 VDC max.</b> (1 s max.)
Recommended Input Fuse		3.3 Vin models: <b>750 mA</b> (slow blow) 5 Vin models: <b>750 mA</b> (slow blow) 12 Vin models: <b>750 mA</b> (slow blow) 24 Vin models: <b>750 mA</b> (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		<b>Internal Capacitor</b>

## Output Specifications

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

## General Specifications

Relative Humidity		<b>95% max.</b> (non condensing)
Temperature Ranges	- Operating Temperature	<b>-40°C to +85°C</b>
	- Case Temperature	<b>+105°C max.</b>
	- Storage Temperature	<b>-50°C to +125°C</b>
Power Derating	- High Temperature	<b>3.33 %/K above 70°C</b> (5 Vout models) <b>4 %/K above 75°C</b> (other models) See application note: <a href="http://www.tracopower.com/overview/tme">www.tracopower.com/overview/tme</a>
Cooling System		<b>Natural convection</b> (20 LFM)
Regulator Topology		<b>Push-Pull Converter</b>

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 - Input to Output, 1 s	1'000 VDC 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 <a href="http://www.tracopower.com/info/cleaning.pdf">www.tracopower.com/info/cleaning.pdf</a>
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: 5 Vin models: 12 Vin models: 24 Vin models:	1.3 g 1.3 g 1.3 g 1.7 g
Thermal Impedance	- Case to Ambient	78 K/W typ.
Environmental Compliance	- REACH Declaration  - RoHS Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: No Exemptions

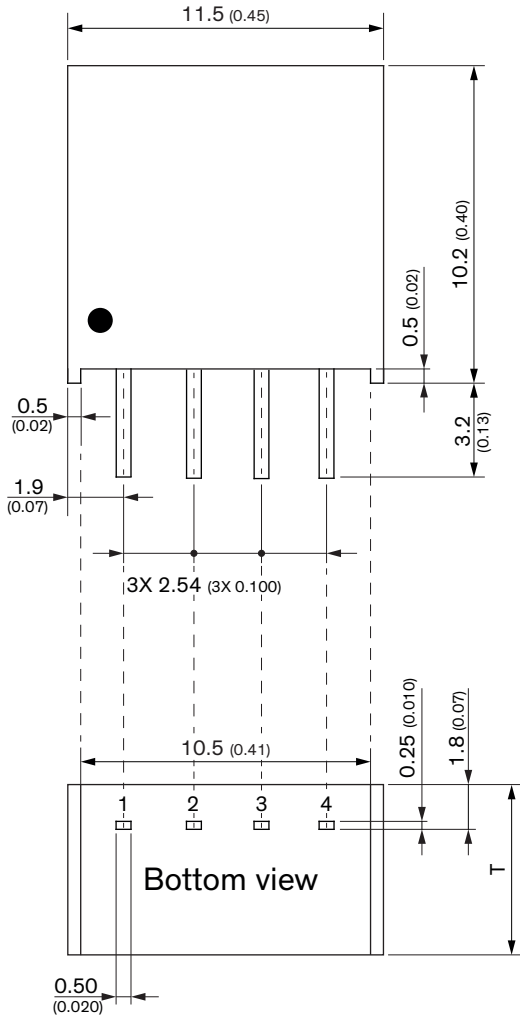
## Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tme](http://www.tracopower.com/overview/tme)

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

**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)