

# **DC/DC Converters**

TME Series, 1 Watt

#### **Features**

- Single-in-line package (SIP)
- ◆ I/O isolation 1'000 VDC
- Unregulated device
- ♦ High efficiency up to 80%
- ◆ Operating temperature -40°C to +85°C
- ♦ Industry standard pinout
- ◆ 100% burn-in (8 h)
- Lead free design, RoHS compliant
- 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				
Ordercode	Input voltage	Output voltage	Output current max.	Efficiency typ.
TME 0303S		3.3 VDC	260 mA	74 %
TME 0305S	3.3 VDC ±10%	5.0 VDC	200 mA	77 %
TME 0503S		3.3 VDC	260 mA	72 %
TME 0505S	5 VDC ±10%	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	12 VDC ±10%	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	24 VDC ±10%	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 current no load /full load  3.3 Vin models: 5 Vin models: 13 mA / 170 mA typ. 12 Vin models: 13 mA / 110 mA typ. 7 mA / 55 mA typ. 3.3 Vin models: 9 V max. 12 Vin models: 18 V max. 19 Vin models: 18 V max. 19 V max. 19 V max. 19 V max. 19 V max. 24 Vin models: 24 Vin models: 24 Vin models: 25 Vin models: 26 V max. 26 V max. 27 V max. 28 V max. 29 V max. 29 V max. 20 V max. 21 Vin models: 20 V max. 21 Vin models: 21 Vin models: 21 V max. 22 Vin models: 21 V max. 23 V V max. 24 Vin models: 24 Vin models: 25 V V max. 26 V max. 27 V max. 28 V max. 29 V max. 20 V max. 20 V max. 20 V V max. 20 V V max. 20 V V max. 21 V max. 21 V max. 22 Vin models: 21 V max.	Input Specifications			
S Vin models: 12 Vin models: 12 Vin models: 24 Vin models: 24 Vin models: 24 Vin models: 30 V max. 30 V max.   Reflected input ripple current capacitors   Constitution			5 Vin models: 12 Vin models:	30 mA / 270 mA typ. 13 mA / 110 mA typ.
Input filter Internal capacitors  Output Specifications  Voltage set accuracy	Surge voltage (1 s max.)		5 Vin models: 12 Vin models:	9 V max. 18 V max.
Output Specifications         Voltage set accuracy       ±1 % typ. / ±3 % max.         Regulation       - Input variation (1 % change of input voltage)       1.2 % typ. / 1.5 % max.         4 to 14 % max. (depending on model)       4 to 14 % max. (depending on model)         Ripple and noise (20 MHz Bandwidth)       150 mVp·p max.         Temperature coefficient       ±0.01 %/K typ. / ±0.02 %/K max.         Short circuit protection       limited 0.5 s max.         Capacitive load       33 μF max.         General Specifications         Temperature ranges       - Operating         - Case temperature       +90°C max.         - Storage       -50°C to +125°C         Derating       5 VDC output models:       3.3 %/K above 70°C         4.0 %/K above 75°C       4.0 %/K above 75°C         Humidity (non condensing)       95 % rel H max.         Reliability, calculated MTTF (MIL+DBK:217F, @+25°C ground benign)       >2'000'000 h         Isolation voltage (60 sec.)       Input/Output       60 pF typ.	Reflected input ripple current			can be reduced by ext. 1 – 3.3 µF polyester film capacitor
Voltage set accuracy  Regulation  - Input variation (1 % change of input voltage) - Load variation (20 – 100 %)  Ripple and noise (20 MHz Bandwidth)  150 mVp-p max.  Temperature coefficient  ±0.01 %/K typ. / ±0.02 %/K max.  Short circuit protection  Iimited 0.5 s max.  Capacitive load  General Specifications  Temperature ranges  - Operating - Case temperature - Storage  - Storage  5 VDC output models: other output models: A0 %/K above 70°C  4.0 %/K above 75°C  Humidity (non condensing)  95 % rel H max.  Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C ground benign)  Input/Output  1000 VDC  Isolation capacity  Input/Output	Input filter			Internal capacitors
Regulation — Input variation (1 % change of input voltage) — Load variation (20 – 100 %) — Load	<b>Output Specification</b>	S		
Load variation (20 − 100 %)   4 to 14 % max. (depending on model)	Voltage set accuracy			±1 % typ. / ±3 % max.
Temperature coefficient ±0.01 %/K typ. / ±0.02 %/K max.  Short circuit protection limited 0.5 s max.  Capacitive load 33 μF max.  General Specifications  Temperature ranges Operating -40°C to +85°C +90°C max50°C to +125°C  Derating 5 VDC output models: 0.3 %/K above 70°C 4.0 %/K above 75°C  Humidity (non condensing) 95 % rel H max.  Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C ground benign) >2′000′000 h  Isolation voltage (60 sec.) Input/Output 10′000 VDC  Isolation capacity Input/Output 60 pF typ.	Regulation			
Short circuit protection limited 0.5 s max.  Capacitive load 33 µF max.  General Specifications  Temperature ranges - Operating - Case temperature - Storage - Storage - Operating - Storage - Operating - Operati	Ripple and noise (20 MHz	Bandwidth)		150 mVp-p max.
Capacitive load  General Specifications  Temperature ranges  - Operating - Case temperature - Storage  Derating  5 VDC output models: other output models: 4.0 %/K above 70°C 4.0 %/K above 75°C  Humidity (non condensing)  Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C ground benign)  Isolation voltage (60 sec.) Input/Output  Input/Output  60 pF typ.	Temperature coefficient			$\pm 0.01$ %/K typ. / $\pm 0.02$ %/K max.
Temperature ranges  - Operating - Case temperature - Storage  Derating  5 VDC output models: other output models: 4.0 %/K above 70°C 4.0 %/K above 75°C  Humidity (non condensing)  Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C ground benign)  Isolation voltage (60 sec.)  Input/Output  Input/Output  60 pF typ.	Short circuit protection			limited 0.5 s max.
Temperature ranges - Operating - 40°C to +85°C +90°C max 5torage - 5 VDC output models: 3.3 %/K above 70°C other output models: 4.0 %/K above 75°C - 4.0	Capacitive load			33 μF max.
- Case temperature - Storage  5 VDC output models: other output models: 4.0 %/K above 70°C 4.0 %/K above 75°C  Humidity (non condensing)  95 % rel H max.  Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C ground benign)  Isolation voltage (60 sec.) Input/Output  Input/Output  60 pF typ.	General Specificatio	ns		
ther output models: 4.0 %/K above 75°C  Humidity (non condensing) 95 % rel H max.  Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C ground benign) >2′000′000 h  Isolation voltage (60 sec.) Input/Output 1′000 VDC  Isolation capacity Input/Output 60 pF typ.	Temperature ranges	- Case temperature		+90°C max.
Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C ground benign) >2′000′000 h  Isolation voltage (60 sec.) Input/Output 1′000 VDC  Isolation capacity Input/Output 60 pF typ.				
Isolation voltage (60 sec.)     Input/Output     1'000 VDC       Isolation capacity     Input/Output     60 pF typ.	Humidity (non condensing)			95 % rel H max.
Isolation capacity Input/Output 60 pF typ.	Reliability, calculated MTTF (MIL-HDBK-217F, @+25°C ground benign)			>2′000′000 h
	Isolation voltage (60 sec.)	Input/Output		1'000 VDC
Isolation resistance Input/Output >1'000 Mohm	Isolation capacity	Input/Output		60 pF typ.
	Isolation resistance	Input/Output		>1′000 Mohm
Switching frequency 50 to 110 kHz (Frequency modulation)	Switching frequency			50 to 110 kHz (Frequency modulation)

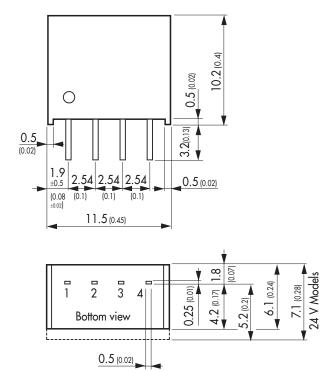
All specifications valid at nominal input voltage, full load and  $+25^{\circ}\text{C}$  after warm-up time unless otherwise stated.





Physical Specifications		
Casing material		non conductive black plastic (UL 94-VO rated)
Package weight	3.3 / 5.0 / 12 Vin models	
-	24 Vin models	1.7 g (0.06 oz)
Soldering temperature		max. 265°C / 10 s

#### **Outline Dimensions mm (inches)**



P	Pin-Out		
Pin	Single		
1	-Vin (GND)		
2	+Vin (Vcc)		
3	-Vout		
4	+Vout		

Tolerances  $\pm 0.25 (\pm 0.01)$ Pin pich tolerance  $\pm 0.13$  ( $\pm 0.005$ ) pins  $\pm 0.05 (\pm 0.002)$ 

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### **TRACO Power:**

<u>TME 0305S</u> <u>TME 0512S</u> <u>TME 1215S</u> <u>TME 1209S</u> <u>TME 2409S</u> <u>TME 0505S</u> <u>TME 1205S</u> <u>TME 0515S</u> <u>TME 2412S</u> TME 2405S <u>TME 2415S</u> <u>TME 1212S</u> <u>TME 0509S</u> <u>TME 0503S</u> <u>TME 0303S</u>