

#### Features

- ◆ Single-in-line (SIP) package
- ◆ Single and dual output models
- ◆ I/O isolation 1'000 VDC
- ◆ High efficiency up to 81%
- ◆ Operating temp. range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- ◆ Industry standard pinout
- ◆ 100% Burn-in (8 h)
- ◆ Lead free design, RoHS compliant
- ◆ 3-year product warranty



The TMA series are miniature, isolated 1 W DC/DC-converters in a Single-in-Line package (SIP). Requiring only 1.2 cm<sup>2</sup> 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.
TMA 0505S	5 VDC $\pm$ 10%	5 VDC	200 mA	71 %
TMA 0512S		12 VDC	80 mA	78 %
TMA 0515S		15 VDC	65 mA	78 %
TMA 0505D		$\pm$ 5 VDC	$\pm$ 100 mA	72 %
TMA 0512D		$\pm$ 12 VDC	$\pm$ 40 mA	78 %
TMA 0515D		$\pm$ 15 VDC	$\pm$ 35 mA	79 %
TMA 1205S	12 VDC $\pm$ 10%	5 VDC	200 mA	73 %
TMA 1212S		12 VDC	80 mA	80 %
TMA 1215S		15 VDC	65 mA	80 %
TMA 1205D		$\pm$ 5 VDC	$\pm$ 100 mA	74 %
TMA 1212D		$\pm$ 12 VDC	$\pm$ 40 mA	81 %
TMA 1215D		$\pm$ 15 VDC	$\pm$ 35 mA	81 %
TMA 1505S	15 VDC $\pm$ 10%	5 VDC	200 mA	73 %
TMA 1512S		12 VDC	80 mA	80 %
TMA 1515S		15 VDC	65 mA	80 %
TMA 1505D		$\pm$ 5 VDC	$\pm$ 100 mA	74 %
TMA 1512D		$\pm$ 12 VDC	$\pm$ 40 mA	81 %
TMA 1515D		$\pm$ 15 VDC	$\pm$ 35 mA	81 %
TMA 2405S	24 VDC $\pm$ 10%	5 VDC	200 mA	71 %
TMA 2412S		12 VDC	80 mA	78 %
TMA 2415S		15 VDC	65 mA	79 %
TMA 2405D		$\pm$ 5 VDC	$\pm$ 100 mA	72 %
TMA 2412D		$\pm$ 12 VDC	$\pm$ 40 mA	79 %
TMA 2415D		$\pm$ 15 VDC	$\pm$ 35 mA	80 %

## Input Specifications

Input current no load /full load	5 Vin models: 30 mA / 260 mA typ. 12 Vin models: 12 mA / 110 mA typ. 15 Vin models: 12 mA / 100 mA typ. 24 Vin models: 7 mA / 55 mA typ.
Surge voltage (1 sec. max.)	5 Vin models: 9 V max. 12 Vin models: 18 V max. 15 Vin models: 21 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 $\mu$ F polyester film capacitor
Input filter	internal capacitors

## Output Specifications

Voltage set accuracy	$\pm 3$ %
Voltage balance (dual output models)	$\pm 1$ % max.
Regulation	– Input variation $\pm 1.2$ % / 1 % change Vin – Load variation 20 – 100 % $\pm 10$ % max.
Ripple and noise (20 MHz Bandwidth)	100 mVp-p typ.
Temperature coefficient	$\pm 0.02$ %/K
Short circuit protection	limited 1 sec. max.
Capacitive load	– Single output models 220 $\mu$ F max. – Dual output models 100 $\mu$ F max.

## General Specifications

Temperature ranges	– Operating $-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ – Case temperature $+95^{\circ}\text{C}$ max. – Storage $-40^{\circ}\text{C}$ to $+105^{\circ}\text{C}$
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 (input/output)	1'000 VDC
Isolation capacitance (input/output)	60 pF typ.
Isolation resistance (input/output)	$>1'000$ Mohm
Switching frequency	100 kHz typ. (frequency modulation)
Frequency change over line and load	$\pm 30$ % max.
Environmental compliance	– Reach <a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a> – RoHS RoHS directive 2011/65/EU

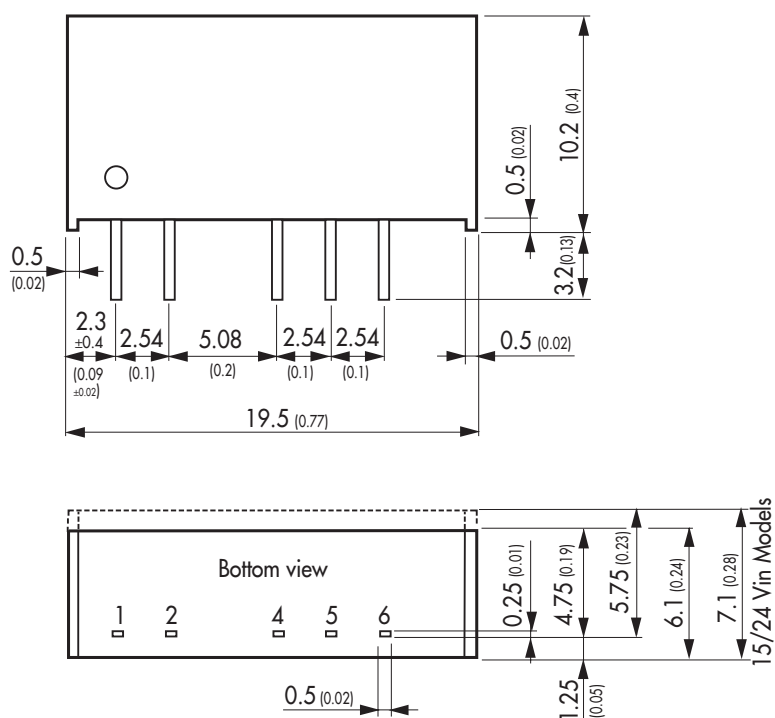
**Application note:** [www.tracopower.com/products/tma-application.pdf](http://www.tracopower.com/products/tma-application.pdf)

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 94V-0 rated)	
Package weight	Single output models:	2.1 g (0.07 oz)
	Dual output models:	2.6 g (0.09 oz)
Soldering temperature	max. 265°C / 10 sec	

## Outline Dimensions mm (inches)



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

Tolerances  $\pm 0.25$  ( $\pm 0.01$ )  
pins  $\pm 0.05$  ( $\pm 0.002$ )