



#### Features

- ◆ Single-in-Line (SIL) Package
- ◆ Single and Dual Output Models
- ◆ I/O-Isolation 1'000 VDC
- ◆ High Efficiency up to 81%
- ◆ Operating Temperature  $-40^{\circ}\text{C}$  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 µF polyester film capacitor
Input filter	internal capacitors

## Output Specifications

Voltage set accuracy	± 3 %
Voltage balance (dual output models)	± 1 % max.
Regulation	– Input variation – Load variation 20 – 100 % ± 1.2 % / 1 % change Vin ± 10 % max.
Ripple and noise (20 MHz Bandwidth)	75 mV pk-pk max.
Temperature coefficient	± 0.02 % / K
Short circuit protection	limited 1 sec. max.
Capacitive load	– Single output models – Dual output models 220 µF max. 100 µF max.

## General Specifications

Temperature ranges	– Operating – Case temperature – Storage –40 °C ... +85 °C +95 °C max. –40 °C ... +105 °C
Humidity (non condensing)	95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217E)	>2'000'000 h @ 25 °C
Isolation voltage (input/output)	1'000 VDC
Isolation capacity (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	± 30 % max.

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

Case 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	

Figure 1 shows two mechanical drawings of the 15/24 V in Models. The top drawing is a front view, and the bottom drawing is a bottom view.

**Front View Dimensions:**

- Total width: 19.5 (0.77)
- Total height: 10.2 (0.4)
- Left circular feature diameter: 0.5 (0.02)
- Slot widths and spacings (from left to right):
  - Slot 1: 2.3 ±0.4 (0.09 ±0.02)
  - Space 1: 0.1 (0.1)
  - Slot 2: 2.54 (0.1)
  - Space 2: 5.08 (0.2)
  - Slot 3: 2.54 (0.1)
  - Space 3: 0.1 (0.1)
  - Slot 4: 2.54 (0.1)
  - Space 4: 0.1 (0.1)
  - Slot 5: 2.54 (0.1)
  - Space 5: 0.1 (0.1)
  - Slot 6: 2.54 (0.1)
  - Space 6: 0.1 (0.1)
  - Slot 7: 2.54 (0.1)
  - Space 7: 0.1 (0.1)
  - Slot 8: 2.54 (0.1)
  - Space 8: 0.1 (0.1)
  - Slot 9: 2.54 (0.1)
  - Space 9: 0.1 (0.1)
  - Slot 10: 2.54 (0.1)
  - Space 10: 0.1 (0.1)
  - Slot 11: 2.54 (0.1)
  - Space 11: 0.1 (0.1)
  - Slot 12: 2.54 (0.1)
  - Space 12: 0.1 (0.1)
  - Slot 13: 2.54 (0.1)
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  - Slot 14: 2.54 (0.1)
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  - Space 98: 0.1 (0.1)
  - Slot 99: 2.54 (0.1)

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