

#### 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°C to +85°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 ± 10%   | 5 VDC          | 200 mA              | 71 %            |
| TMA 0512S |               | 12 VDC         | 80 mA               | 78 %            |
| TMA 0515S |               | 15 VDC         | 65 mA               | 78 %            |
| TMA 0505D |               | ± 5 VDC        | ±100 mA             | 72 %            |
| TMA 0512D |               | ±12 VDC        | ± 40 mA             | 78 %            |
| TMA 0515D |               | ±15 VDC        | ±35 mA              | 79 %            |
| TMA 1205S | 12 VDC ± 10%  | 5 VDC          | 200 mA              | 73 %            |
| TMA 1212S |               | 12 VDC         | 80 mA               | 80 %            |
| TMA 1215S |               | 15 VDC         | 65 mA               | 80 %            |
| TMA 1205D |               | ±5 VDC         | ±100 mA             | 74 %            |
| TMA 1212D |               | ±12 VDC        | ±40 mA              | 81 %            |
| TMA 1215D |               | ±15 VDC        | ±35 mA              | 81 %            |
| TMA 1505S | 15 VDC ± 10%  | 5 VDC          | 200 mA              | 73 %            |
| TMA 1512S |               | 12 VDC         | 80 mA               | 80 %            |
| TMA 1515S |               | 15 VDC         | 65 mA               | 80 %            |
| TMA 1505D |               | ±5 VDC         | ±100 mA             | 74 %            |
| TMA 1512D |               | ±12 VDC        | ±40 mA              | 81 %            |
| TMA 1515D |               | ±15 VDC        | ±35 mA              | 81 %            |
| TMA 2405S | 24 VDC ± 10%  | 5 VDC          | 200 mA              | 71 %            |
| TMA 2412S |               | 12 VDC         | 80 mA               | 78 %            |
| TMA 2415S |               | 15 VDC         | 65 mA               | 79 %            |
| TMA 2405D |               | ±5 VDC         | ±100 mA             | 72 %            |
| TMA 2412D |               | ±12 VDC        | ±40 mA              | 79 %            |
| TMA 2415D |               | ±15 VDC        | ±35 mA              | 80 %            |

### Input Specifications

|                                  |   |
|----------------------------------|---|
| Input current no load /full load | 5 Vin models: 30 mA / 260 mA typ.<br>12 Vin models: 12 mA / 110 mA typ.<br>15 Vin models: 12 mA / 100 mA typ.<br>24 Vin models: 7 mA / 55 mA typ. |
| Surge voltage (1 sec. max.)      | 5 Vin models: 9 V max.<br>12 Vin models: 18 V max.<br>15 Vin models: 21 V max.<br>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 ±1.2 % / 1 % change Vin<br>– Load variation 20 – 100 % ±10 % max. |
| Ripple and noise (20 MHz Bandwidth)  | 100 mVp-p typ.  |
| Temperature coefficient              | ±0.02 %/K   |
| Short circuit protection             | limited 1 sec. max.   |
| Capacitive load                      | – Single output models 220 µF max.<br>– Dual output models 100 µF max.              |

### General Specifications

|   |  |
|---|--|
| Temperature ranges  | – Operating –40°C to +85°C<br>– Case temperature +95°C max.<br>– Storage –40°C to +105°C   |
| Humidity (non condensing)   | 95 % rel H max.  |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°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                                   | ±30 % max.   |
| Environmental compliance  | – Reach <a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a><br>– 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°C after warm-up time unless otherwise stated.

