

#### Features

- Single-in-Line Package (SIP)
- Single and Dual Output Models
- I/O-Isolation 1'000 VDC
- High Efficiency up to 81%
- Operating Temperature -40°C to +85°C
- Pin-compatible with other Manufacturers
- 100% Burn-in (8 h)
- 2 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<br>TMA 0512S<br>TMA 0515S<br>TMA 0505D<br>TMA 0512D<br>TMA 0515D | 5 VDC ± 10%   | 5 VDC<br>12 VDC<br>15 VDC<br>± 5 VDC<br>±12 VDC<br>±15 VDC | 200 mA<br>80 mA<br>65 mA<br>±100 mA<br>± 40 mA<br>± 30 mA | 71 %<br>78 %<br>78 %<br>72 %<br>78 %<br>79 % |
| TMA 1205S<br>TMA 1212S<br>TMA 1215S<br>TMA 1205D<br>TMA 1212D<br>TMA 1215D | 12 VDC ± 10%  | 5 VDC<br>12 VDC<br>15 VDC<br>± 5 VDC<br>±12 VDC<br>±15 VDC | 200 mA<br>80 mA<br>65 mA<br>±100 mA<br>± 40 mA<br>± 30 mA | 73 %<br>80 %<br>80 %<br>74 %<br>81 %<br>81 % |
| TMA 1505S<br>TMA 1512S<br>TMA 1515S<br>TMA 1505D<br>TMA 1512D<br>TMA 1515D | 15 VDC ± 10%  | 5 VDC<br>12 VDC<br>15 VDC<br>± 5 VDC<br>±12 VDC<br>±15 VDC | 200 mA<br>80 mA<br>65 mA<br>±100 mA<br>± 40 mA<br>± 30 mA | 73 %<br>80 %<br>80 %<br>74 %<br>81 %<br>81 % |
| TMA 2405S<br>TMA 2412S<br>TMA 2415S<br>TMA 2405D<br>TMA 2412D<br>TMA 2415D | 24 VDC ± 10%  | 5 VDC<br>12 VDC<br>15 VDC<br>± 5 VDC<br>±12 VDC<br>±15 VDC | 200 mA<br>80 mA<br>65 mA<br>±100 mA<br>± 40 mA<br>± 30 mA | 71 %<br>78 %<br>79 %<br>72 %<br>79 %<br>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<br>– Load variation 20 – 100 % | ± 1.2 % / 1 % change Vin<br>± 10 % max. |
| Ripple and noise (20 MHz Bandwidth)  |                                                  | 75 mV pk-pk max.                        |
| Temperature coefficient              |                                                  | ± 0.02 % / °C                           |
| Short circuit protection             |                                                  | limited 1 sec. max.                     |
| Capacitive load                      | – Single output models<br>– Dual output models   | 220 µF max.<br>100 µF max.              |

### General Specifications

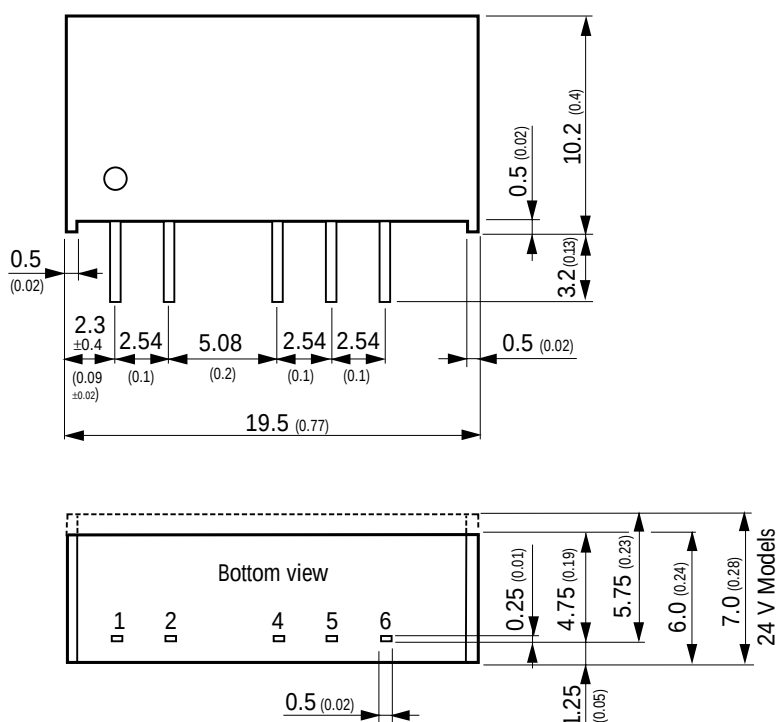
|                                               |                                                |                                                          |
|-----------------------------------------------|------------------------------------------------|----------------------------------------------------------|
| Temperature ranges                            | – Operating<br>– Case temperature<br>– Storage | – 40 °C ... +85 °C<br>+95 °C max.<br>– 40 °C ... +105 °C |
| Humidity (non condensing)                     |                                                | 95 % rel H max.                                          |
| Reliability, calculated MTBF (MIL-HDBK-217 E) |                                                | >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.

## Physical Specifications

|                       |                                                                                |
|-----------------------|--------------------------------------------------------------------------------|
| Case material         | non conductive black plastic<br>(flammability to UL 94-V0)                     |
| Package weight        | – Single output models 2.1 g (0.07 oz)<br>– Dual output models 2.6 g (0.09 oz) |
| Soldering temperature | max. 260°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  $\pm 0.25$  (0.01)

pins  $\pm 0.05$  (0.002)

Specifications can be changed without notice