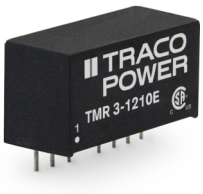
# TRACO POWER

## DC/DC Converter

## TMR 3E Series, 3 Watt

**Not recommended for new designs**

- **Wide 2:1 input voltage range**
- **Compact SIP-8 package**
- **Cost optimized design**
- **Temperature range –40°C to +85°C**
- **I/O isolation 1500 VDC**
- **Remote On/Off control**
- **3-year product warranty**




UL 62368-1 IEC 62368-1

The TMR 3E series is a family of isolated 3 W DC/DC converter modules with regulated output, featuring wide 2:1 input voltage ranges. The product comes in a compact SIP-8 plastic package with small footprint occupying only 2.0 cm² (0.3 square inch) of board space. An excellent efficiency allows –40°C to +85°C operation temperature. Further features include remote On/Off control and continuous short circuit protection. The compact dimensions and cost optimized design make this converters an ideal solution for applications in communication equipment, instrumentation and industrial electronics.

## Models

| Order Code | Input Voltage Range | Output 1 | | Output 2 | | Efficiency |
|---|---|---|---|---|---|---|
| | | Vnom | Imax | Vnom | Imax | typ. |
| **TMR 3-0510E *** | 4.5 - 9 VDC (5 VDC nom.) | 3.3 VDC | 700 mA | | | 71 % |
| **TMR 3-0511E *** | | 5 VDC | 600 mA | | | 73 % |
| **TMR 3-0512E *** | | 12 VDC | 250 mA | | | 79 % |
| **TMR 3-0513E *** | | 15 VDC | 200 mA | | | 79 % |
| **TMR 3-0521E *** | | +5 VDC | 300 mA | –5 VDC | 300 mA | 74 % |
| **TMR 3-0522E *** | | +12 VDC | 125 mA | –12 VDC | 125 mA | 79 % |
| **TMR 3-0523E *** | | +15 VDC | 100 mA | –15 VDC | 100 mA | 79 % |
| **TMR 3-1210E *** | 9 - 18 VDC (12 VDC nom.) | 3.3 VDC | 700 mA | | | 75 % |
| **TMR 3-1211E *** | | 5 VDC | 600 mA | | | 78 % |
| **TMR 3-1212E *** | | 12 VDC | 250 mA | | | 83 % |
| **TMR 3-1213E *** | | 15 VDC | 200 mA | | | 83 % |
| **TMR 3-1221E *** | | +5 VDC | 300 mA | –5 VDC | 300 mA | 79 % |
| **TMR 3-1222E *** | | +12 VDC | 125 mA | –12 VDC | 125 mA | 83 % |
| **TMR 3-1223E *** | | +15 VDC | 100 mA | –15 VDC | 100 mA | 83 % |
| **TMR 3-2410E *** | 18 - 36 VDC (24 VDC nom.) | 3.3 VDC | 700 mA | | | 75 % |
| **TMR 3-2411E *** | | 5 VDC | 600 mA | | | 78 % |
| **TMR 3-2412E *** | | 12 VDC | 250 mA | | | 83 % |
| **TMR 3-2413E *** | | 15 VDC | 200 mA | | | 83 % |
| **TMR 3-2421E *** | | +5 VDC | 300 mA | –5 VDC | 300 mA | 80 % |
| **TMR 3-2422E *** | | +12 VDC | 125 mA | –12 VDC | 125 mA | 83 % |
| **TMR 3-2423E *** | | +15 VDC | 100 mA | –15 VDC | 100 mA | 83 % |
| **TMR 3-4810E *** | 36 - 75 VDC (48 VDC nom.) | 3.3 VDC | 700 mA | | | 75 % |
| **TMR 3-4811E *** | | 5 VDC | 600 mA | | | 78 % |
| **TMR 3-4812E *** | | 12 VDC | 250 mA | | | 83 % |
| **TMR 3-4813E *** | | 15 VDC | 200 mA | | | 83 % |
| **TMR 3-4821E *** | | +5 VDC | 300 mA | –5 VDC | 300 mA | 80 % |
| **TMR 3-4822E *** | | +12 VDC | 125 mA | –12 VDC | 125 mA | 83 % |
| **TMR 3-4823E *** | | +15 VDC | 100 mA | –15 VDC | 100 mA | 83 % |

Note * Not recommended for new designs

## Input Specifications

| | | | |
|---|---|---|---|
| Input Current | - At no load | 5 Vin models: | 70 mA typ. |
| | | 12 Vin models: | 20 mA typ. |
| | | 24 Vin models: | 10 mA typ. |
| | | 48 Vin models: | 8 mA typ. |
| | - At full load | 5 Vin models: | 760 mA typ. |
| | | 12 Vin models: | 300 mA typ. |
| | | 24 Vin models: | 150 mA typ. |
| | | 48 Vin models: | 75 mA typ. |
| Surge Voltage | | 5 Vin models: | 11 VDC max. (1 s max.) |
| | | 12 Vin models: | 25 VDC max. (1 s max.) |
| | | 24 Vin models: | 50 VDC max. (1 s max.) |
| | | 48 Vin models: | 100 VDC max. (1 s max.) |
| Under Voltage Lockout | | 5 Vin models: | 3.5 VDC typ. / 4 VDC max. |
| | | 12 Vin models: | 6.5 VDC typ. / 8.5 VDC max. |
| | | 24 Vin models: | 11 VDC typ. / 17 VDC max. |
| | | 48 Vin models: | 22 VDC typ. / 34 VDC max. |
| | | | (Long term operation at undervoltage will damage the converter) |
| Recommended Input Fuse | | 5 Vin models: | 2'000 mA (slow blow) |
| | | 12 Vin models: | 1'000 mA (slow blow) |
| | | 24 Vin models: | 500 mA (slow blow) |
| | | 48 Vin models: | 250 mA (slow blow) |
| | | | (The need of an external fuse has to be assessed in the final application.) |
| Input Filter | | | Internal Capacitor |

## Output Specifications

| | | | |
|---|---|---|---|
| Voltage Set Accuracy | | | ±1% max. |
| Regulation | - Input Variation (Vmin - Vmax) | single output models: | 0.5% max. |
| | | dual output models: | 0.5% max. |
| | - Load Variation (25 - 100%) | single output models: | 1% max. |
| | | dual output models: | 1% max. (Output 1) |
| | | | 1% max. (Output 2) |
| | - Voltage Balance (symmetrical load) | dual output models: | 2% max. |
| Ripple and Noise | - 20 MHz Bandwidth | | 75 mVp-p max. |
| | | | 50 mVp-p typ. |
| Capacitive Load | - single output | 3.3 Vout models: | 1'760 µF max. |
| | | 5 Vout models: | 1'000 µF max. |
| | | 12 Vout models: | 170 µF max. |
| | | 15 Vout models: | 110 µF max. |
| | - dual output | 5 / -5 Vout models: | 470 / 470 µF max. |
| | | 12 / -12 Vout models: | 100 / 100 µF max. |
| | | 15 / -15 Vout models: | 47 / 47 µF max. |
| Minimum Load | | | 25 % of Iout max. |
| | | | (Operation at lower load will not damage the converter, but it may not meet all specifications) |
| Temperature Coefficient | | | ±0.02 %/K max. |
| Short Circuit Protection | | | Continuous, Automatic recovery |
| Overload Protection | | | Foldback Mode |
| Output Current Limitation | | | 110% min. of Iout max. |
| | | | 140% typ. of Iout max. |
| Transient Response | - Response Deviation | | 5% max. (25% Load Step) |
| | - Response Time | | 300 µs typ. (25% Load Step) |

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

## Safety Specifications

| | | |
|---|---|---|
| Standards | - IT / Multimedia Equipment | EN 60950-1<br>EN 62368-1<br>IEC 60950-1<br>IEC 62368-1<br>UL 60950-1<br>UL 62368-1 |
| | - Certification Documents | www.tracopower.com/tmr3e-safety-cert/ |
| Over Voltage Category | | Not mains connected |

## EMC Specifications

| | | |
|---|---|---|
| EMI (Emissions) | - Conducted Emissions | EN 55032 class A (with external filter)<br>EN 55032 class B (with external filter) |
| | External filter proposal: | www.tracopower.com/tmr3e-emc-filter/ |

## General Specifications

| | | |
|---|---|---|
| Relative Humidity | | 95% max. (non condensing) |
| Temperature Ranges | - Operating Temperature | –40°C to +85°C |
| | - Case Temperature | +100°C max. |
| | - Storage Temperature | –55°C to +125°C |
| Power Derating | - High Temperature | 3.3 %/K above 70°C |
| | See application note: | www.tracopower.com/tmr3e-cc/ |
| Cooling System | | Natural convection (20 LFM) |
| Remote Control | - Voltage Controlled Remote (passive = on) | On: < 0.6 VDC or open circuit<br>Off: 2.7 to 15 VDC<br>Refers to 'Remote' and '-Vin' Pin |
| | - Off Idle Input Current | 2.5 mA max. |
| | - Remote Pin Input Current | -1.0 to 1.0 mA |
| Altitude During Operation | | 5'000 m max. |
| Switching Frequency | | 300 kHz typ. (PFM) |
| Insulation System | | Functional Insulation |
| Isolation Test Voltage | - Input to Output, 60 s | 1'600 VDC |
| | - Input to Output, 1 s | 1'920 VDC |
| Isolation Resistance | - Input to Output, 500 VDC | 1'000 MΩ min. |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | 200 pF max. |
| Reliability | - Calculated MTBF | 1'200'000 h (MIL-HDBK-217F, ground benign) |
| Washing Process | | According to Cleaning Guideline<br>www.tracopower.com/info/cleaning.pdf |
| Housing Material | | Non-conductive Plastic (UL 94 V-0 rated) |
| Potting Material | | Epoxy (UL 94 V-0 rated) |
| Pin Material | | Nickel-Iron (Alloy 42) |
| Pin Foundation Plating | | Nickel (1 µm min.) |
| Pin Surface Plating | | Tin (3 - 5 µm), matte |
| Housing Type | | Plastic Case |
| Mounting Type | | PCB Mount |
| Connection Type | | THD (Through-Hole Device) |
| Footprint Type | | SIP8 |
| Soldering Profile | | Lead-Free Wave Soldering<br>260°C / 10 s max. |
| Weight | | 4.8 g |

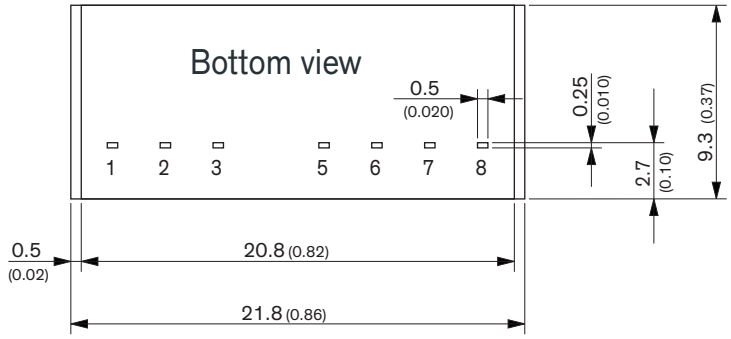
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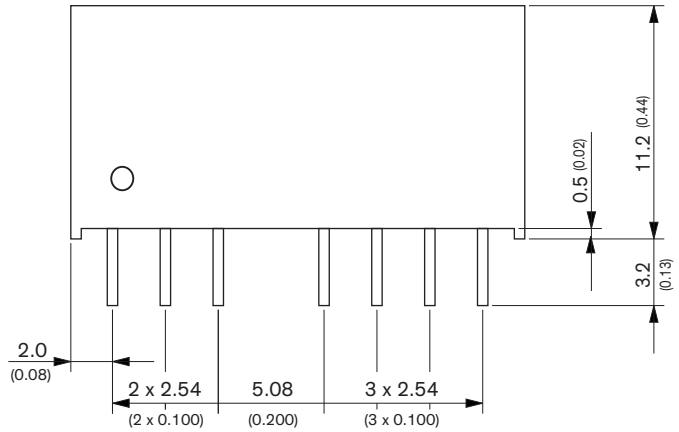
| | | |
|---|---|---|
| Environmental Compliance | - REACH Declaration | www.tracopower.com/info/reach-declaration.pdf<br>REACH SVHC list compliant<br>REACH Annex XVII compliant |
| | - RoHS Declaration | www.tracopower.com/info/rohs-declaration.pdf<br>Exemptions: 7(a)<br>(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).) |
| | - SCIP Reference Number | 7699dacc-969f-4d57-b8a7-128450575e87 |

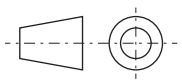
## Additional Information

| | |
|---|---|
| Supporting Documents | www.tracopower.com/overview/tmr3e |
| Frequently Asked Questions | www.tracopower.com/glossary-faq |
| Glossary | www.tracopower.com/info/glossary.pdf |
| Service Portal | www.tracoserviceportal.com |

## Outline Dimensions



Dimensions in mm (inch)
Tolerances: X.X±0.5 (X.XX±0.02)
X.XX±0.25 (X.XXX±0.010)
Pin Tolerances: ±0.1(±0.004)

| Pinout | | |
|---|---|---|
| **Pin** | **Single Output** | **Dual Output** |
| **1** | –Vin (GND) | –Vin (GND) |
| **2** | +Vin (Vcc) | +Vin (Vcc) |
| **3** | Remote | Remote |
| **5** | NC | NC |
| **6** | +Vout | +Vout |
| **7** | –Vout | Common |
| **8** | NC | –Vout |

NC: Not connected

Avoid routing PCB traces under the converter.

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