

- Compact SMD package
11,9 × 11,3 × 8,0 mm
- Fully regulated outputs
- Input Voltage range
4.5-13.2, 9-18, 18-36, 36-75 VDC
- I/O-isolation 1'600 VDC
- Operating temperature range
-40°C to +85°C
- Short circuit protection
- 3-year product warranty



The TRN 3SM Series comprises 3 Watt fully regulated, high performance DC/DC converters. They come in a compact cubical package of only 1.07 cm³. Full load operation is reliable up to 85°C environment temperature. With 1'600 VDC I/O-isolation voltage, and short current protection they cover a wide range of application when space is limited. The input of the converters is designed for a wide voltage range (2:1) and minimum load is not required.

| Models | | | | |
|--------------|-----------------------------------|----------------|---------------------|-----------------|
| Order code | Input voltage | Output voltage | Output current max. | Efficiency typ. |
| TRN 3-0510SM | 4.5 – 13.2 VDC (9 VDC nominal) | 3.3 VDC | 700 mA | 75 % |
| TRN 3-0511SM | | 5.0 VDC | 600 mA | 78 % |
| TRN 3-0512SM | | 12 VDC | 250 mA | 82 % |
| TRN 3-0513SM | | 15 VDC | 200 mA | 80 % |
| TRN 3-0515SM | | 24 VDC | 125 mA | 80 % |
| TRN 3-0521SM | | ± 5.0 VDC | ±300 mA | 77 % |
| TRN 3-0522SM | | ±12 VDC | ±125 mA | 80 % |
| TRN 3-0523SM | | ±15 VDC | ±100 mA | 80 % |
| TRN 3-1210SM | 9 – 18 VDC (12 VDC nominal) | 3.3 VDC | 700 mA | 76 % |
| TRN 3-1211SM | | 5.0 VDC | 600 mA | 79 % |
| TRN 3-1212SM | | 12 VDC | 250 mA | 84 % |
| TRN 3-1213SM | | 15 VDC | 200 mA | 83 % |
| TRN 3-1215SM | | 24 VDC | 125 mA | 82 % |
| TRN 3-1221SM | | ± 5.0 VDC | ±300 mA | 78 % |
| TRN 3-1222SM | | ±12 VDC | ±125 mA | 82 % |
| TRN 3-1223SM | | ±15 VDC | ±100 mA | 81 % |
| TRN 3-2410SM | 18 – 36 VDC (24 VDC nominal) | 3.3 VDC | 700 mA | 76 % |
| TRN 3-2411SM | | 5.0 VDC | 600 mA | 78 % |
| TRN 3-2412SM | | 12 VDC | 250 mA | 84 % |
| TRN 3-2413SM | | 15 VDC | 200 mA | 84 % |
| TRN 3-2415SM | | 24 VDC | 125 mA | 83 % |
| TRN 3-2421SM | | ± 5.0 VDC | ±300 mA | 79 % |
| TRN 3-2422SM | | ±12 VDC | ±125 mA | 83 % |
| TRN 3-2423SM | | ±15 VDC | ±100 mA | 82 % |
| TRN 3-4810SM | 36 – 75 VDC (48 VDC nominal) | 3.3 VDC | 700 mA | 75 % |
| TRN 3-4811SM | | 5.0 VDC | 600 mA | 79 % |
| TRN 3-4812SM | | 12 VDC | 250 mA | 83 % |
| TRN 3-4813SM | | 15 VDC | 200 mA | 83 % |
| TRN 3-4815SM | | 24 VDC | 125 mA | 82 % |
| TRN 3-4821SM | | ± 5.0 VDC | ±300 mA | 77 % |
| TRN 3-4822SM | | ±12 VDC | ±125 mA | 82 % |
| TRN 3-4823SM | | ±15 VDC | ±100 mA | 80 % |

Input Specifications

| | |
|-----------------------------|--|
| Input current no load | 9 Vin models: 75 mA max. 12 Vin models: 40 mA max. 24 Vin models: 20 mA max. 48 Vin models: 12 mA max. |
| Surge voltage (1 sec. max.) | 9 Vin models: 15 V max. 12 Vin models: 25 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max. |
| Reflected ripple current | 9 Vin models: 100 mAp-p typ. 12 & 24 Vin models: 75 mAp-p typ. 48 Vin models: 50 mAp-p typ. |
| Conducted noise | – conducted input emission EN 55032 class A or B with external components |
| EMC immunity | – ESD (electrostatic discharge) – Radiated immunity – Fast transient / surge (with external input capacitor) – Conducted immunity – Magnetic field immunity EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±1 kV perf. criteria A Nippon chemi-con KY 220 µF/ 100 V EN 61000-4-6, 10 Vrms, perf. criteria A EN 61000-4-8 100 A/m, continuous, perf. criteria A 1000 A/m, 1 sec., perf. criteria A |
| Input filter | capacitor type |

Output Specifications

| | |
|---|--|
| Voltage set accuracy | ±1 % max. |
| Regulation | – Input variation – Load variation 0 – 100 % – cross regulation - dual output: 0.2 % max. 1 % max. 5 % max. (asymmetrical load 25 % / 100 %) |
| Temperature coefficient | ±0.02 %/K typ. |
| Ripple and noise (20 MHz Bandwidth) | 50 mVp-p typ. |
| Start-up time | 15 ms max. (5 ms typ.) |
| Transient response (25% load step change) | 500 µs typ. |
| Short circuit protection | continuous, automatic recovery |
| Capacitive load | –Single output 3.3 VDC models: 4400 µF max. 5.0 VDC models: 2200 µF max. 12 VDC models: 1000 µF max. 15 VDC models: 820 µF max. 24 VDC models: 330 µF max. –Dual output ±5.0 VDC models: 1200 µF max. (each output) ±12 VDC models: 520 µF max. (each output) +15 VDC models: 440 µF max. (each output) |

General Specifications

| | |
|----------------------------------|--|
| Temperature ranges | – Operating (convection cooling 20LFM, 0,1m/s) – Case temperature – Storage temperature –40°C to +85°C +95°C max. –55°C to +125°C |
| Derating | 2.5%/K above 65°C |
| Humidity (non condensing) | 5 – 95 % rel H max. |
| Isolation voltage | – I/O isolation voltage (60 sec.) 1'600 VDC |
| Isolation capacitance | 75 pF max. |
| Isolation resistance (@ 500 VDC) | >1 Gohm |

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

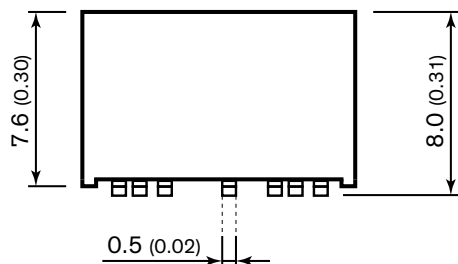
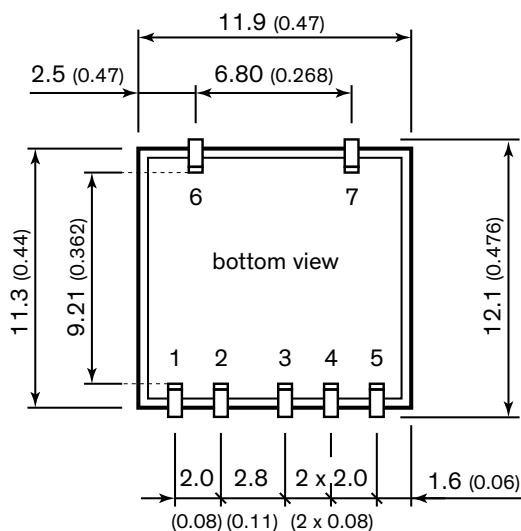
General Specifications

| | |
|--|---|
| Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign) | 4'400'000 h |
| Switching frequency | 100 kHz min. Pulse frequency modulation. |
| Thermal shock & vibration | MIL-STD-810F |
| Safety standards | – Information technology IEC/EN 60950-1, UL 60950-1 |
| Environmental compliance | – Reach – RoHS RoHS directive 2011/65/EU |

Physical Specifications

| | |
|------------------|------------------------------|
| Casing material | non-conductive black plastic |
| Potting material | silicone (UL 94V-0 rated) |
| Package weight | 2.1g (0.07oz) |

Outline Dimensions



| Pin-Out | | |
|---------|------------|------------|
| Pin | Single | Dual |
| 1 | -Vin (GND) | -Vin (GND) |
| 2 | +Vin (Vcc) | +Vin (Vcc) |
| 3 | +Vout | +Vout |
| 4 | no pin | common |
| 5 | -Vout | -Vout |
| 6 | NC | NC |
| 7 | NC | NC |

Dimensions in [mm], () = Inch

Tolerances: x.x ±0.5 (±0.02)

x.xx ±0.25 (±0.01)

Pin pitch tolerances ±0.25 (±0.01)

Pin dimension tolerance ±0.1 (±0.004)

Specifications can be changed without notice!

Rev. September 18, 2017

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