

DC/DC Converter

TDN 5WISM Series, 5 Watt

- Ultra compact SMD package
13,2 × 9,1 × 10,2 mm
- I/O-isolation 1'600 VDC
- Fully regulated outputs
- Operating temperature range
-40°C to +75°C
- Short circuit protection
- Remote On/Off
- 3-year product warranty



Also see:

TDN 5WI, DIP version

www.tracopower.com/products/tdn5wi.pdf

The TDN 5WISM Series redefines the power density of high performance DC/DC converters. The cubical package of only 1.23 cm³ encloses a sophisticated circuit which provides 5 Watt output power. They operate up to 50°C environment temperature at full load or up to 75°C with a 50% load derating. With 1'600 VDC I/O-isolation voltage, external On/Off, 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 (4:1) and minimum load is not required.

| Models | | | | |
|----------------|-----------------------------------|----------------|---------------------|-----------------|
| Order code | Input voltage | Output voltage | Output current max. | Efficiency typ. |
| TDN 5-0910WISM | 4.5 – 13.2 VDC (9 VDC nominal) | 3.3 VDC | 1000 mA | 76 % |
| TDN 5-0911WISM | | 5.0 VDC | 1000 mA | 80 % |
| TDN 5-0912WISM | | 12 VDC | 420 mA | 83 % |
| TDN 5-0913WISM | | 15 VDC | 333 mA | 83 % |
| TDN 5-0915WISM | | 24 VDC | 210 mA | 83 % |
| TDN 5-0921WISM | | ± 5.0 VDC | ±500 mA | 80 % |
| TDN 5-0922WISM | | ±12 VDC | ±210 mA | 83 % |
| TDN 5-0923WISM | | ±15 VDC | ±168 mA | 83 % |
| TDN 5-2410WISM | 9 – 36 VDC (24 VDC nominal) | 3.3 VDC | 1000 mA | 76 % |
| TDN 5-2411WISM | | 5.0 VDC | 1000 mA | 80 % |
| TDN 5-2412WISM | | 12 VDC | 420 mA | 83 % |
| TDN 5-2413WISM | | 15 VDC | 333 mA | 83 % |
| TDN 5-2415WISM | | 24 VDC | 210 mA | 83 % |
| TDN 5-2421WISM | | ± 5.0 VDC | ±500 mA | 80 % |
| TDN 5-2422WISM | | ±12 VDC | ±210 mA | 83 % |
| TDN 5-2423WISM | | ±15 VDC | ±168 mA | 84 % |
| TDN 5-4810WISM | 18 – 75 VDC (48 VDC nominal) | 3.3 VDC | 1000 mA | 76 % |
| TDN 5-4811WISM | | 5.0 VDC | 1000 mA | 81 % |
| TDN 5-4812WISM | | 12 VDC | 420 mA | 83 % |
| TDN 5-4813WISM | | 15 VDC | 333 mA | 83 % |
| TDN 5-4815WISM | | 24 VDC | 210 mA | 83 % |
| TDN 5-4821WISM | | ± 5.0 VDC | ±500 mA | 80 % |
| TDN 5-4822WISM | | ±12 VDC | ±210 mA | 83 % |
| TDN 5-4823WISM | | ±15 VDC | ±168 mA | 84 % |

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Input Specifications

| | |
|--|--|
| Input current at no load | 9 Vin models: 80 mA typ. 24 Vin models: 30 mA typ. 48 Vin models: 15 mA typ. |
| Surge voltage (1 sec. max.) | 9 Vin models: 15 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max. |
| Reflected ripple current | 9 Vin models: 40 mAp-p typ. 24 Vin models: 20 mAp-p typ. 48 Vin models: 15 mAp-p typ. |
| Conducted noise | EN 55022 class A or B with external components, see supporting documents |
| ESD (electrostatic discharge) | EN 61000-4-2, air ± 8 kV, contact ± 6 kV, perf. criteria A |
| Radiated immunity | EN 61000-4-3, 10 V/m, perf. criteria A |
| Fast transient / surge (with external input capacitor) | EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 1 kV perf. criteria A |
| – external input capacitor | all models: Nippon chemi-con KY 220 μ F/100V |
| Conducted immunity | EN 61000-4-6, 10 Vrms, perf. criteria A |
| Magnetic field immunity | EN 61000-4-8, 100 A/m continuous, perf. criteria A 1000 A/m 1 second, perf. criteria A |

Output Specifications

| | |
|---|---|
| Voltage set accuracy | ± 1 % max. |
| Regulation | – Input variation: 0.2 % max. – Load variation 0 – 100 %: 1 % max. – cross regulation - dual output: 5 % max. (asymmetrical load 25 % / 100 %) |
| Temperature coefficient | ± 0.02 %/K typ. |
| Ripple and noise (20 MHz Bandwidth) | 9 Vin models: 50 mVp-p typ. other models: 75 mVp-p typ. |
| Start up time | – Power ON: 10 ms typ. / 20 ms max. – Remote ON: 10 ms typ. / 20 ms max. |
| Transient response (25% load step change) | 500 μ s typ. |
| Short circuit protection | continuous, automatic recovery |
| Capacitive load | – Single output: 3.3 VDC models: 4400 μ F max. 5.0 VDC models: 2200 μ F max. 12 VDC models: 1220 μ F max. 15 VDC models: 1000 μ F max. 24 VDC models: 470 μ F max. – Dual output: ± 5.0 VDC models: 1000 μ F max. (each output) ± 12 VDC models: 680 μ F max. (each output) $+15$ VDC models: 440 μ F max. (each output) |

General Specifications

| | |
|----------------------------------|---|
| Temperature ranges | – Operating (convection cooling 20LFM, 0,1m/s): -40°C to $+75^{\circ}\text{C}$ – Case temperature: $+105^{\circ}\text{C}$ max. – Storage temperature: -55°C to $+125^{\circ}\text{C}$ |
| Derating | 1.8%/K above 50°C |
| Humidity (non condensing) | 5 – 95 % rel H max. |
| Isolation voltage | – I/O isolation voltage (60 sec.): 1'600 VDC |
| Isolation capacitance | 50 pF max. |
| Isolation resistance (@ 500 VDC) | >1 Gohm |

All specifications valid at nominal input voltage, full load and $+25^{\circ}\text{C}$ after warm-up time unless otherwise stated.

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General Specifications

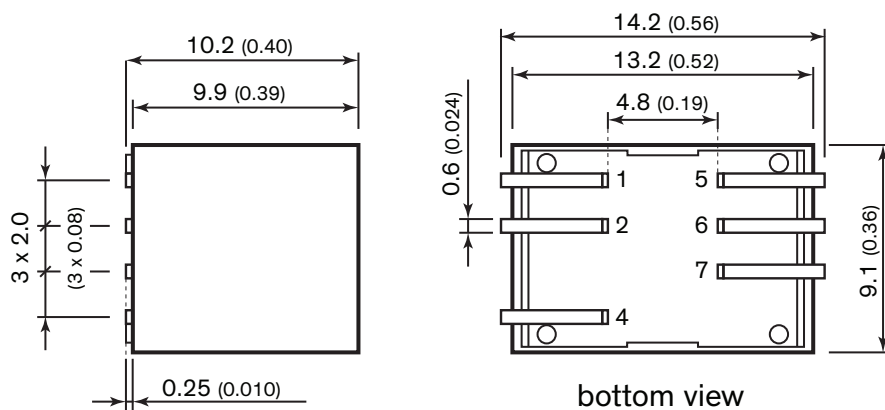
| | |
|--|--|
| Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign) | 2'280'000 h |
| Switching frequency | 100 kHz min. Pulse frequency modulation. |
| Thermal shock & vibration | MIL-STD-810F |
| Remote On/Off | -On: -Off: -Off idle current: |
| Environmental compliance | - Reach - RoHS |
| Moisture sensitivity level (MSL) | IPC J-STD-033B Level 2 |

Physical Specifications

| | |
|---------------------------------|-------------------------------------|
| Casing material | non-conducting FR4 (UL 94V-0 rated) |
| Potting material | silicone (UL 94V-0 rated) |
| Base material | non-conducting FR4 (UL 94V-0 rated) |
| Package weight | 2.7g (0.10oz) |
| Soldering temperature | max. 260°C / 6 sec |
| Lead-free reflow solder process | according to IPC J-STD-020D |

Supporting Documents: www.tracopower.com/overview/tdn5wism

Outline Dimensions



Pin-Out

| Pin | Single | Dual |
|-----|------------|------------|
| 1 | +Vin (Vcc) | +Vin (Vcc) |
| 2 | -Vin (GND) | -Vin (GND) |
| 4 | On/Off | On/Off |
| 5 | no con. | -Vout |
| 6 | -Vout | Common |
| 7 | +Vout | +Vout |

Dimensions in [mm], () = Inch

Tolerances: x.x ±0.5 (±0.02)
 Pin pitch tolerances ±0.25 (±0.01)
 Pin dimension tolerance ±0.1 (±0.004)

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