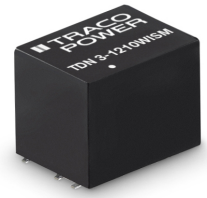
TRACO POWER

## DC/DC Converter

## TDN 3WISM Series, 3 Watt

- **Ultra compact SMD package 13.2 x 9.1 x 10.2 mm**
- **I/O-isolation 1‘600 VDC**
- **Fully regulated outputs**
- **Operating temperature range -40°C to +70°C without derating**
- **Short circuit protection**
- **Remote On/Off**
- **Designed to meet UL 62368-1 (UL 60950-1)**
- **3-year product warranty**




The TDN 3WISM Series comprises 3 Watt fully regulated, high performance DC/DC converters. They come in a compact cubical package of only 1.23 cm3. Full load operation is reliable up tp 70°C environment temperature. 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.
The functional I/O-isolation system is designed to meet IEC/EN 62368-1 with a test voltage (60 s) of 1'600 VDC.

## Models

| Order Code | Input Voltage Range | Output 1 | | Output 2 | | Efficiency |
|---|---|---|---|---|---|---|
| | | Vnom | Imax | Vnom | Imax | typ. |
| **TDN 3-1210WISM** | 4.5 - 18 VDC (12 VDC nom.) | 3.3 VDC | 700 mA | | | 76 % |
| **TDN 3-1211WISM** | | 5 VDC | 600 mA | | | 80 % |
| **TDN 3-1219WISM** | | 9 VDC | 333 mA | | | 81 % |
| **TDN 3-1212WISM** | | 12 VDC | 250 mA | | | 83 % |
| **TDN 3-1213WISM** | | 15 VDC | 200 mA | | | 84 % |
| **TDN 3-1215WISM** | | 24 VDC | 125 mA | | | 82 % |
| **TDN 3-1221WISM** | | +5 VDC | 300 mA | −5 VDC | 300 mA | 80 % |
| **TDN 3-1222WISM** | | +12 VDC | 125 mA | −12 VDC | 125 mA | 82 % |
| **TDN 3-1223WISM** | | +15 VDC | 100 mA | −15 VDC | 100 mA | 82 % |
| **TDN 3-2410WISM** | 9 - 36 VDC (24 VDC nom.) | 3.3 VDC | 700 mA | | | 77 % |
| **TDN 3-2411WISM** | | 5 VDC | 600 mA | | | 80 % |
| **TDN 3-2419WISM** | | 9 VDC | 333 mA | | | 81 % |
| **TDN 3-2412WISM** | | 12 VDC | 250 mA | | | 83 % |
| **TDN 3-2413WISM** | | 15 VDC | 200 mA | | | 83 % |
| **TDN 3-2415WISM** | | 24 VDC | 125 mA | | | 82 % |
| **TDN 3-2421WISM** | | +5 VDC | 300 mA | −5 VDC | 300 mA | 80 % |
| **TDN 3-2422WISM** | | +12 VDC | 125 mA | −12 VDC | 125 mA | 82 % |
| **TDN 3-2423WISM** | | +15 VDC | 100 mA | −15 VDC | 100 mA | 82 % |
| **TDN 3-4810WISM** | 18 - 75 VDC (48 VDC nom.) | 3.3 VDC | 700 mA | | | 77 % |
| **TDN 3-4811WISM** | | 5 VDC | 600 mA | | | 80 % |
| **TDN 3-4819WISM** | | 9 VDC | 333 mA | | | 81 % |
| **TDN 3-4812WISM** | | 12 VDC | 250 mA | | | 83 % |
| **TDN 3-4813WISM** | | 15 VDC | 200 mA | | | 83 % |
| **TDN 3-4815WISM** | | 24 VDC | 125 mA | | | 82 % |
| **TDN 3-4821WISM** | | +5 VDC | 300 mA | −5 VDC | 300 mA | 80 % |
| **TDN 3-4822WISM** | | +12 VDC | 125 mA | −12 VDC | 125 mA | 82 % |
| **TDN 3-4823WISM** | | +15 VDC | 100 mA | −15 VDC | 100 mA | 82 % |

## Input Specifications

| | | | |
|---|---|---|---|
| Input Current | - At no load | 12 Vin models: | 40 mA typ. |
| | | 24 Vin models: | 24 mA typ. |
| | | 48 Vin models: | 13 mA typ. |
| Surge Voltage | | 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.) |
| Reflected Ripple Current | | | 20 mAp-p typ. |
| Recommended Input Fuse | | 12 Vin models: | 1'600 mA (slow blow) |
| | | 24 Vin models: | 800 mA (slow blow) |
| | | 48 Vin models: | 500 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: | 0.2% max. |
| | | dual output models: | 0.2% max. |
| | - Load Variation (0 - 100%) | single output models: | 1% max. |
| | | dual output models: | 1% max. (Output 1) |
| | | | 1% max. (Output 2) |
| | - Cross Regulation (25% / 100% asym. load) | dual output models: | 5% max. |
| Ripple and Noise | - 20 MHz Bandwidth | | 50 mVp-p typ. |
| Capacitive Load | - single output | 3.3 Vout models: | 4'700 µF max. |
| | | 5 Vout models: | 2'530 µF max. |
| | | 9 Vout models: | 1'470 µF max. |
| | | 12 Vout models: | 1'220 µF max. |
| | | 15 Vout models: | 1'000 µF max. |
| | | 24 Vout models: | 470 µF max. |
| | - dual output | 5 / -5 Vout models: | 1'470 / 1'470 µF max. |
| | | 12 / -12 Vout models: | 680 / 680 µF max. |
| | | 15 / -15 Vout models: | 470 / 470 µF max. |
| Minimum Load | | | Not required |
| Temperature Coefficient | | | ±0.02 %/K max. |
| Start-up Time | | | 10 ms typ. / 20 ms max. |
| Short Circuit Protection | | | Continuous, Automatic recovery |
| Transient Response | - Response Time | | 500 µs typ. (25% Load Step) |

## Safety Specifications

| | | |
|---|---|---|
| Safety Standards | - IT / Multimedia Equipment | Designed for EN 62368-1 (no certification) |

## EMC Specifications

| | | | |
|---|---|---|---|
| EMI Emissions | - Conducted Emissions | | EN 55032 class A (with external filter) |
| | | | EN 55032 class B (with external filter) |
| | - Radiated Emissions | | EN 55032 class A (with external filter) |
| | | | EN 55032 class B (with external filter) |
| | | External filter proposal: | www.tracopower.com/overview/tdn3wism |

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

| | | | |
|---|---|---|---|
| EMS Immunity | - Electrostatic Discharge | Air: | EN 61000-4-2, ±8 kV, perf. criteria A |
| | | Contact: | EN 61000-4-2, ±6 kV, perf. criteria A |
| | - RF Electromagnetic Field | | EN 61000-4-3, 10 V/m, perf. criteria A |
| | - EFT (Burst) / Surge | | EN 61000-4-4, ±2 kV, perf. criteria A |
| | | | EN 61000-4-5, ±1 kV, perf. criteria A |
| | | Ext. input component: | KY 220 µF, 100 V |
| | - Conducted RF Disturbances | | EN 61000-4-6, 10 Vrms, perf. criteria A |
| | - PF Magnetic Field | Continuous: | EN 61000-4-8, 100 A/m, perf. criteria A |
| | | 1 s: | EN 61000-4-8, 1000 A/m, perf. criteria A |

## General Specifications

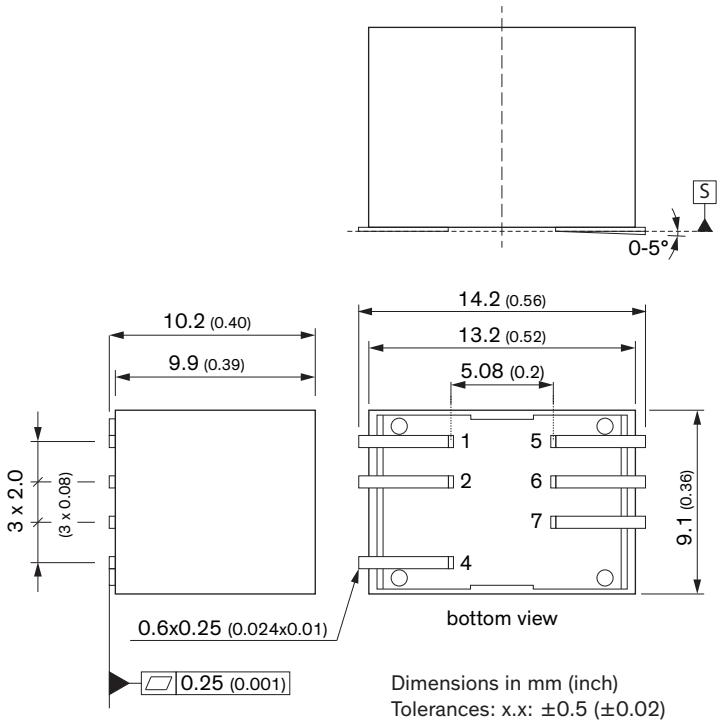
| | | | |
|---|---|---|---|
| Relative Humidity | | | 95% max. (non condensing) |
| Temperature Ranges | - Operating Temperature | | –40°C to +70°C (without derating) |
| | - Case Temperature | | +105°C max. |
| | - Storage Temperature | | –55°C to +125°C |
| Power Derating | - High Temperature | | 2.86 %/K above 70°C |
| | | See application note: | www.tracopower.com/overview/tdn3wism |
| Cooling System | | | Natural convection (20 LFM) |
| Remote Control | - Current Controlled Remote | | On: open circuit |
| | | | Off: 2 to 4 mA current (no internal resistor) |
| | | External circuit proposal: | www.tracopower.com/info/current-remote.pdf |
| | - Off Idle Input Current | | 2.5 mA max. |
| Switching Frequency | | | 100 kHz min. (PFM) |
| Insulation System | | | Functional Insulation |
| Isolation Test Voltage | - Input to Output, 60 s | | 1'600 VDC |
| Isolation Resistance | - Input to Output, 500 VDC | | 1'000 MΩ min. |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | | 50 pF max. |
| Reliability | - Calculated MTBF | | 5'630'000 h (MIL-HDBK-217F, ground benign) |
| Moisture Sensitivity (MSL) | | | Level 2 (J-STD-033C) |
| Washing Process | | | Allowed (hermetical product) |
| | | See Cleaning Guideline: | www.tracopower.com/info/cleaning.pdf |
| Environment | - Vibration | | MIL-STD-810F |
| | - Thermal Shock | | MIL-STD-810F |
| Housing Material | | | Non-conductive Plastic (UL 94 V-0 rated) |
| Base Material | | | Non-conductive Plastic (UL 94 V-0 rated) |
| Potting Material | | | Silicone (UL 94 V-0 rated) |
| Pin Material | | | Copper |
| Pin Foundation Plating | | | Nickel (2 - 3 µm) |
| Pin Surface Plating | | | Tin (3 - 5 µm), matte |
| Housing Type | | | Plastic Case |
| Mounting Type | | | PCB Mount |
| Connection Type | | | SMD (Surface-Mount Device) |
| Footprint Type | | | SMD8 |
| Soldering Profile | | | Reflow Soldering (J-STD-020E) |
| Weight | | | 2.7 g |
| Environmental Compliance | - REACH Declaration | | www.tracopower.com/info/reach-declaration.pdf |
| | | | REACH SVHC list compliant |
| | | | REACH Annex XVII compliant |
| | - RoHS Declaration | | www.tracopower.com/info/rohs-declaration.pdf |
| | | | Exemptions: 7a, 7c-I |
| | | | (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.) |

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

## Supporting Documents

Overview Link (for additional Documents) www.tracopower.com/overview/tdn3wism

## Outline Dimensions

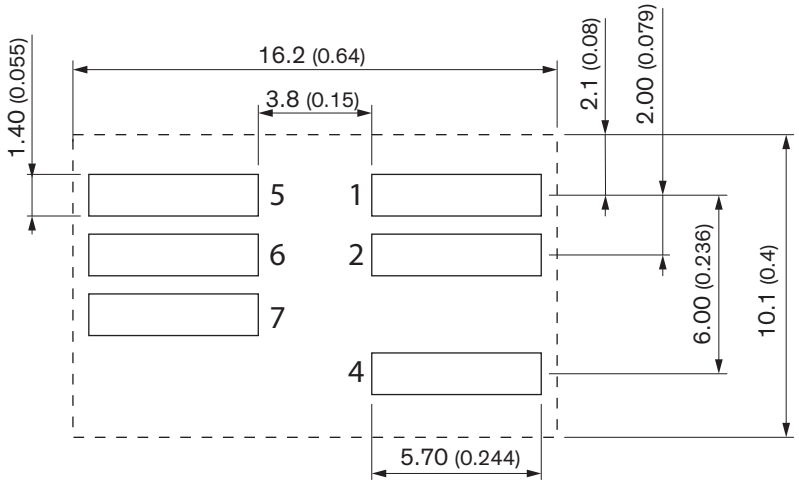



Dimensions in mm (inch)
Tolerances: x.x: ±0.5 (±0.02)
Pin pitch tolerances: ±0.25 (±0.01)
Pin diameter: ±0.1 (±0.004)

| Pinout | | |
|---|---|---|
| **Pin** | **Single** | **Dual** |
| **1** | +Vin (Vcc) | +Vin (Vcc) |
| **2** | –Vin (GND) | –Vin (GND) |
| **4** | Remote On/Off | Remote On/Off |
| **5** | NC | –Vout |
| **6** | –Vout | Common |
| **7** | +Vout | +Vout |

NC: Not Connected

**Recommended Solder Pad Layout**




Dimensions in mm (inch)