

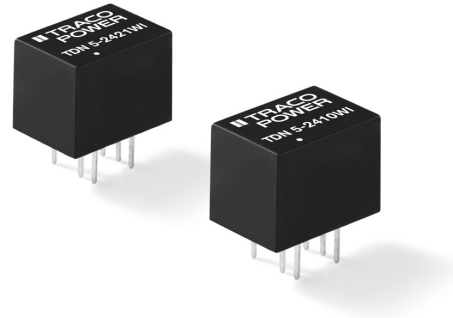
## DC/DC Converter

- Ultra compact DIP 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
- Designed to meet UL 62368-1  
(UL 60950-1)

Also see:

**TDN 5WISM, SMD version**

## TDN 5WI Series, 5 Watt



The TDN 5WI Series redefines the power density of high performance DC/DC converters. The cubical package of only 1.23 cm<sup>3</sup> 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 1600 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 1600 VDC.

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TDN 5-0910WI	4.5 – 13.2 VDC (9 VDC nominal)	3.3 VDC	1000 mA	76 %
TDN 5-0911WI		5.0 VDC	1000 mA	80 %
TDN 5-0919WI		9.0 VDC	555 mA	81 %
TDN 5-0912WI		12 VDC	420 mA	83 %
TDN 5-0913WI		15 VDC	333 mA	83 %
TDN 5-0915WI		24 VDC	210 mA	83 %
TDN 5-0921WI		± 5.0 VDC	±500 mA	80 %
TDN 5-0922WI		±12 VDC	±210 mA	83 %
TDN 5-0923WI		±15 VDC	±168 mA	83 %
TDN 5-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	1000 mA	76 %
TDN 5-2411WI		5.0 VDC	1000 mA	80 %
TDN 5-2419WI		9.0 VDC	555 mA	81 %
TDN 5-2412WI		12 VDC	420 mA	83 %
TDN 5-2413WI		15 VDC	333 mA	83 %
TDN 5-2415WI		24 VDC	210 mA	83 %
TDN 5-2421WI		± 5.0 VDC	±500 mA	80 %
TDN 5-2422WI		±12 VDC	±210 mA	83 %
TDN 5-2423WI		±15 VDC	±168 mA	84 %
TDN 5-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	1000 mA	76 %
TDN 5-4811WI		5.0 VDC	1000 mA	81 %
TDN 5-4819WI		9.0 VDC	555 mA	81 %
TDN 5-4812WI		12 VDC	420 mA	83 %
TDN 5-4813WI		15 VDC	333 mA	83 %
TDN 5-4815WI		24 VDC	210 mA	83 %
TDN 5-4821WI		± 5.0 VDC	±500 mA	80 %
TDN 5-4822WI		±12 VDC	±210 mA	83 %
TDN 5-4823WI		±15 VDC	±168 mA	84 %

## 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
ESD (electrostatic discharge)	EN 61000-4-2, air $\pm 8$ kV, contact $\pm 6$ 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, $\pm 2$ kV, perf. criteria A EN 61000-4-5, $\pm 1$ kV perf. criteria A
–external input capacitor	all models: Nippon chemi-con KY 220 $\mu$ F/100V
Conducted immunity	EN 61000-4-6, 10 Vrms, perf. criteria A
Power frequency magnetic field	EN 61000-4-8, 100 A/m, perf. criteria A

## Output Specifications

Voltage set accuracy	$\pm 1$ % max.
Voltage balance (dual output models)	1 % max.
Regulation	– Input variation – Load variation 0 – 100 %
	single output: 0.2 % max. dual output: 1 % max. cross regulation - dual output: 1 % max. (balanced load) 5 % max. (asymmetrical load 25 % / 100 %)
Temperature coefficient	$\pm 0.02$ %/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 – Remote ON
(constant resistive load)	10 ms typ. / 20 ms max. 10 ms typ. / 20 ms max.
Transient response (25% load step change)	500 $\mu$ s typ.
Short circuit protection	continuous, automatic recovery
Capacitive load	–Single output
	3.3 VDC models: 4400 $\mu$ F max. 5.0 VDC models: 2200 $\mu$ F max. 9.0 VDC models: 1470 $\mu$ F max. 12 VDC models: 1220 $\mu$ F max. 15 VDC models: 1000 $\mu$ F max. 24 VDC models: 470 $\mu$ F max.
	–Dual output
	$\pm 5.0$ VDC models: 1000 $\mu$ F max. (each output) $\pm 12$ VDC models: 680 $\mu$ F max. (each output) $\pm 15$ VDC models: 440 $\mu$ F max. (each output)

## General Specifications

Temperature ranges	– Operating (convection cooling 20LFM, 0,1m/s) – Case temperature – Storage temperature
	–40°C to +75°C +105°C max. –55°C to +125°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.

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

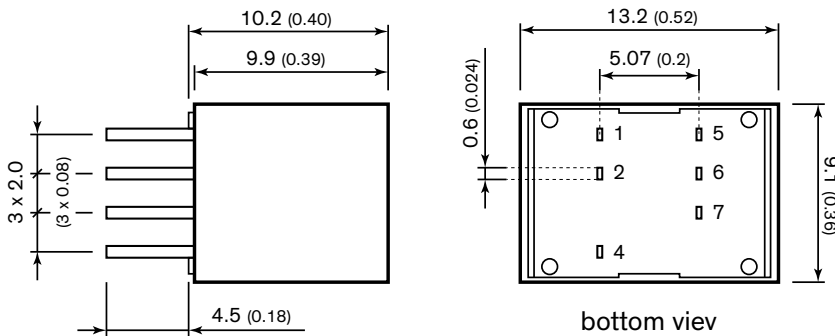
### General Specifications

Isolation resistance (@ 500 VDC)		>1 Gohm
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	<ul style="list-style-type: none"> <li>-On:</li> <li>-Off:</li> <li>-Off idle current:</li> </ul>	<ul style="list-style-type: none"> <li>open circuit or high impedance</li> <li>2 – 4 mA current applied via 1kOhm resistor</li> <li>2.5 mA max.</li> </ul>
Safety standards	- Designed to meet (no certification)	IEC/EN/UL 62368-1, UL 60950-1
Environmental compliance	<ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>	RoHS directive 2011/65/EU

### Physical Specifications

Casing material	non-conducting FR4 (UL 94V-0 rated)
Potting material	silicone (UL 94V-0 rated)
Pin material	tinned copper
Package weight	2.7 g (0.10 oz)
Soldering temperature	260°C / 6 s max.

### 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)