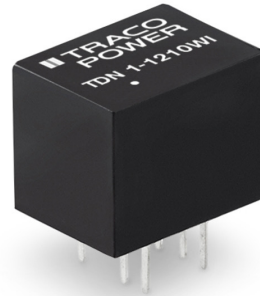


DC/DC Converter

TDN 1WI Series, 1 Watt

- Compact DIP package
13,2 × 9,1 × 10,2 mm
- Fully regulated outputs
- I/O-isolation 1'600 VDC
- Operating temperature range
-40°C to +90°C without derating
- Short circuit protection
- Remote On/Off
- 3-year product warranty
- Designed to meet UL 62368-1
(UL 60950-1)



The TDN 1WI Series comprises 1 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 to 90°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 1500 VDC.

Also see:

TDN 1WISM, SMD version

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TDN 1-1210WI	4.5 – 18 VDC (12 VDC nominal)	3.3 VDC	300 mA	77 %
TDN 1-1211WI		5.0 VDC	200 mA	79 %
TDN 1-1219WI		9.0 VDC	112 mA	79 %
TDN 1-1212WI		12 VDC	90 mA	81 %
TDN 1-1213WI		15 VDC	70 mA	81 %
TDN 1-1215WI		24 VDC	45 mA	80 %
TDN 1-1221WI		± 5.0 VDC	±100 mA	77 %
TDN 1-1222WI		±12 VDC	±45 mA	80 %
TDN 1-1223WI		±15 VDC	±35 mA	81 %
TDN 1-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	300 mA	76 %
TDN 1-2411WI		5.0 VDC	200 mA	78 %
TDN 1-2419WI		9.0 VDC	112 mA	79 %
TDN 1-2412WI		12 VDC	90 mA	81 %
TDN 1-2413WI		15 VDC	70 mA	81 %
TDN 1-2415WI		24 VDC	45 mA	80 %
TDN 1-2421WI		± 5.0 VDC	±100 mA	77 %
TDN 1-2422WI		±12 VDC	±45 mA	80 %
TDN 1-2423WI		±15 VDC	±35 mA	81 %
TDN 1-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	300 mA	75 %
TDN 1-4811WI		5.0 VDC	200 mA	78 %
TDN 1-4819WI		9.0 VDC	112 mA	79 %
TDN 1-4812WI		12 VDC	90 mA	81 %
TDN 1-4813WI		15 VDC	70 mA	81 %
TDN 1-4815WI		24 VDC	45 mA	80 %
TDN 1-4821WI		± 5.0 VDC	±100 mA	77 %
TDN 1-4822WI		±12 VDC	±45 mA	80 %
TDN 1-4823WI		±15 VDC	±35 mA	81 %

Input Specifications

Input current no load	12 Vin models: 20 mA typ 24 Vin models: 10 mA typ. 48 Vin models: 5 mA typ.
Surge voltage (1 s max.)	12 Vin models: 25 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max.
Reflected ripple current	12 Vin models: 15 mAp-p typ. 24 Vin models: 10 mAp-p typ. 48 Vin models: 5 mAp-p typ.
Conducted noise	EN 55032 class A or B (with external components)
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)	30 mVp-p typ.
Start up time	– Power ON: 10 ms max. – Remote ON: 10 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: 1680 μ F max. 5.0 VDC models: 820 μ F max. 9.0 VDC models: 630 μ F max. 12 VDC models: 470 μ F max. 15 VDC models: 330 μ F max. 24 VDC models: 160 μ F max. – Dual output: ± 5.0 VDC models: 470 μ F max. (each output) ± 12 VDC models: 330 μ F max. (each output) $+15$ VDC models: 220 μ F max. (each output)

General Specifications

Temperature ranges	– Operating (natural convection: 20 LFM, 0.1m/s): -40°C to $+90^{\circ}\text{C}$ (without derating) – Case temperature: $+105^{\circ}\text{C}$ max. – Storage temperature: -55°C to $+125^{\circ}\text{C}$
Derating	6.7%/K above 90°C
Humidity (non condensing)	5 – 95 % rel H max.
Isolation voltage	– I/O isolation voltage (60 s): 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.

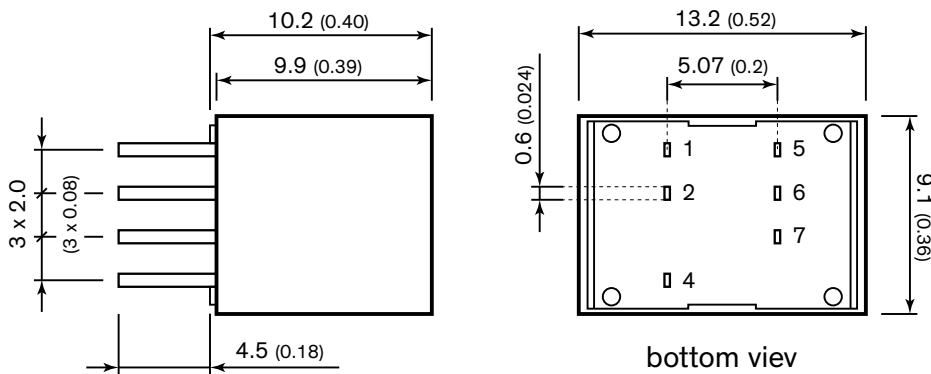
General Specifications

Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)	8'400'000 h	
Switching frequency	100 kHz min. (pulse frequency modulation)	
Thermal shock & vibration	MIL-STD-810F	
Remote On/Off	<ul style="list-style-type: none"> - On: open circuit or high impedance - Off: 2 – 4 mA current applied via 1kOhm resistor - Off idle current: 2.5 mA max. 	
Safety standards	<ul style="list-style-type: none"> - Designed to meet (no certification) 	IEC/EN/UL 62368-1, UL 60950-1
Environmental compliance	<ul style="list-style-type: none"> - Reach - RoHS 	RoHS directive 2011/65/EU

Physical Specifications

Casing material	non-conducting plastic
Potting material	silicone (UL 94V-0 rated)
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)