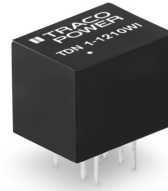


DC/DC Converter**TDN 1WI Series, 1 Watt**

- Compact DIP 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 +90°C without derating
- Short circuit protection
- Remote On/Off
- Designed to meet UL 62368-1
(UL 60950-1)
- 3-year product warranty



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 1'600 VDC.

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I _{max}	Vnom	I _{max}	
TDN 1-1210WI	4.5 - 18 VDC (12 VDC nom.)	3.3 VDC	300 mA			77 %
TDN 1-1211WI		5 VDC	200 mA			79 %
TDN 1-1219WI		9 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 VDC	100 mA	-5 VDC	100 mA	77 %
TDN 1-1222WI		+12 VDC	45 mA	-12 VDC	45 mA	80 %
TDN 1-1223WI		+15 VDC	35 mA	-15 VDC	35 mA	81 %
TDN 1-2410WI	9 - 36 VDC (24 VDC nom.)	3.3 VDC	300 mA			76 %
TDN 1-2411WI		5 VDC	200 mA			78 %
TDN 1-2419WI		9 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 VDC	100 mA	-5 VDC	100 mA	77 %
TDN 1-2422WI		+12 VDC	45 mA	-12 VDC	45 mA	80 %
TDN 1-2423WI		+15 VDC	35 mA	-15 VDC	35 mA	81 %
TDN 1-4810WI	18 - 75 VDC (48 VDC nom.)	3.3 VDC	300 mA			75 %
TDN 1-4811WI		5 VDC	200 mA			78 %
TDN 1-4819WI		9 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 VDC	100 mA	-5 VDC	100 mA	77 %
TDN 1-4822WI		+12 VDC	45 mA	-12 VDC	45 mA	80 %
TDN 1-4823WI		+15 VDC	35 mA	-15 VDC	35 mA	81 %

Input Specifications

Input Current	- At no load	12 Vin models: 20 mA typ. 24 Vin models: 10 mA typ. 48 Vin models: 5 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		12 Vin models: 15 mAp-p typ. 24 Vin models: 10 mAp-p typ. 48 Vin models: 5 mAp-p typ.
Recommended Input Fuse		12 Vin models: 500 mA (slow blow) 24 Vin models: 315 mA (slow blow) 48 Vin models: 160 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) - Load Variation (0 - 100%) - Cross Regulation (25% / 100% asym. load)	single output models: 0.2% max. dual output models: 0.2% max. single output models: 1% max. dual output models: 1% max. (Output 1) 1% max. (Output 2) dual output models: 5% max.
Ripple and Noise	- 20 MHz Bandwidth	30 mVp-p typ.
Capacitive Load	- single output - dual output	3.3 Vout models: 1'680 µF max. 5 Vout models: 820 µF max. 9 Vout models: 630 µF max. 12 Vout models: 470 µF max. 15 Vout models: 330 µF max. 24 Vout models: 160 µF max. 5 / -5 Vout models: 470 / 470 µF max. 12 / -12 Vout models: 330 / 330 µF max. 15 / -15 Vout models: 220 / 220 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)
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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/tdn1wi

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 μ F, 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

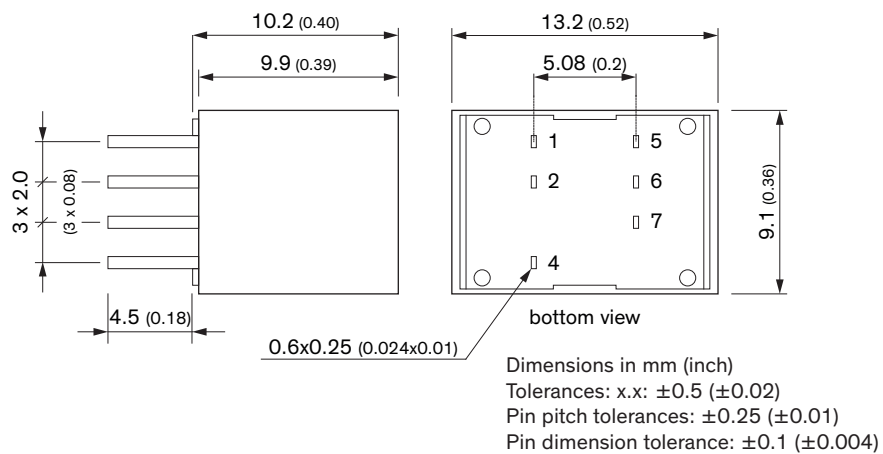
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +90°C (without derating)
	- Case Temperature	+105°C max.
	- Storage Temperature	-55°C to +125°C
Power Derating	- High Temperature	6.67 %/K above 90°C
Cooling System		Natural convection (20 LFM)
Remote Control	- 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 2.5 mA max.
	- Off Idle Input Current	
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 M Ω min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	50 pF max.
Reliability	- Calculated MTBF	8'400'000 h (MIL-HDBK-217F, ground benign)
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 μ m)
Pin Surface Plating		Tin (3 - 5 μ m), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		DIP8
Soldering Profile		260°C / 6 s max.
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 (Q5A rule). The SCIP number is provided on request.)

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tdn1wi
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All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Outline Dimensions



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