

DC/DC Converter

TDN 5WISM Series, 5 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 +75°C
- Short circuit protection
- Remote On/Off
- Designed to meet IEC/EN/UL 62368-1
(not certified)
- 3-year product warranty



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 without any compromise regarding reliability and functionality. They operate up to 50°C environment temperature at full load or up to 70°C with a 50% load de-rating. 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/UL 62368-1 (not certified) 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 5-0910WISM	4.5 - 13.2 VDC (9 VDC nom.)	3.3 VDC	1'000 mA			76 %
TDN 5-0911WISM		5 VDC	1'000 mA			80 %
TDN 5-0919WISM		9 VDC	555 mA			81 %
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 VDC	500 mA	-5 VDC	500 mA	80 %
TDN 5-0922WISM		+12 VDC	210 mA	-12 VDC	210 mA	83 %
TDN 5-0923WISM		+15 VDC	168 mA	-15 VDC	168 mA	83 %
TDN 5-2410WISM	9 - 36 VDC (24 VDC nom.)	3.3 VDC	1'000 mA			76 %
TDN 5-2411WISM		5 VDC	1'000 mA			80 %
TDN 5-2419WISM		9 VDC	555 mA			81 %
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 VDC	500 mA	-5 VDC	500 mA	80 %
TDN 5-2422WISM		+12 VDC	210 mA	-12 VDC	210 mA	83 %
TDN 5-2423WISM		+15 VDC	168 mA	-15 VDC	168 mA	84 %
TDN 5-4810WISM	18 - 75 VDC (48 VDC nom.)	3.3 VDC	1'000 mA			76 %
TDN 5-4811WISM		5 VDC	1'000 mA			81 %
TDN 5-4819WISM		9 VDC	555 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 VDC	500 mA	-5 VDC	500 mA	80 %
TDN 5-4822WISM		+12 VDC	210 mA	-12 VDC	210 mA	83 %
TDN 5-4823WISM		+15 VDC	168 mA	-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		9 Vin models: 15 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		9 Vin models: 40 mAp-p typ. 24 Vin models: 20 mAp-p typ. 48 Vin models: 15 mAp-p typ.
Recommended Input Fuse		9 Vin models: 2'500 mA (slow blow) 24 Vin models: 1'250 mA (slow blow) 48 Vin models: 630 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	75 mVp-p typ.
Capacitive Load	- single output - dual output	3.3 Vout models: 4'400 µF max. 5 Vout models: 2'200 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. 5 / -5 Vout models: 1'000 / 1'000 µF max. 12 / -12 Vout models: 680 / 680 µF max. 15 / -15 Vout models: 440 / 440 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

Standards	- IT / Multimedia Equipment	Designed for IEC/EN/UL 62368-1 (not certified)
Over Voltage Category		Not mains connected

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/tdn5wism-emc-filter

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 +75°C
	- Case Temperature	+105°C max.
	- Storage Temperature	-55°C to +125°C
Power Derating	- High Temperature	Depending on model
	See application note:	www.tracopower.com/tdn5wism-cc
Cooling System		Natural convection (20 LFM)
Remote Control	- Current Controlled Remote (passive = on)	On: open circuit
		Off: 2 to 4 mA current (no internal resistor)
		Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current	External circuit proposal: www.tracopower.com/info/current-remote.pdf 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 M Ω min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	50 pF max.
Reliability	- Calculated MTBF	2'960'000 h (9 Vin models)
		2'280'000 h (other models)
		(MIL-HDBK-217F, ground benign)
Moisture Sensitivity (MSL)		Level 2 (J-STD-033C)
Washing Process		According to 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 FR4 (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		SMD (Surface-Mount Device)
Footprint Type		SMD8
Soldering Profile		Lead-Free Reflow Soldering (acc. J-STD-020E)
		245°C max. (Tp)
		15 s max. (tp, at Tp - 5°C)
		90 s max. (tL, time above 217°C)
	See application note:	www.tracopower.com/info/reflow-soldering.pdf
Weight		2.7 g

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

Environmental Compliance - REACH Declaration

www.tracopower.com/info/reach-declaration.pdf

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

www.tracopower.com/info/rohs-declaration.pdf

Exemptions: 7(a), 7(c)-I

(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)

- SCIP Reference Number

8fc743ba-ed28-4846-8011-e1e97ccb7dc7

Additional Information

Supporting Documents

www.tracopower.com/overview/tdn5wism

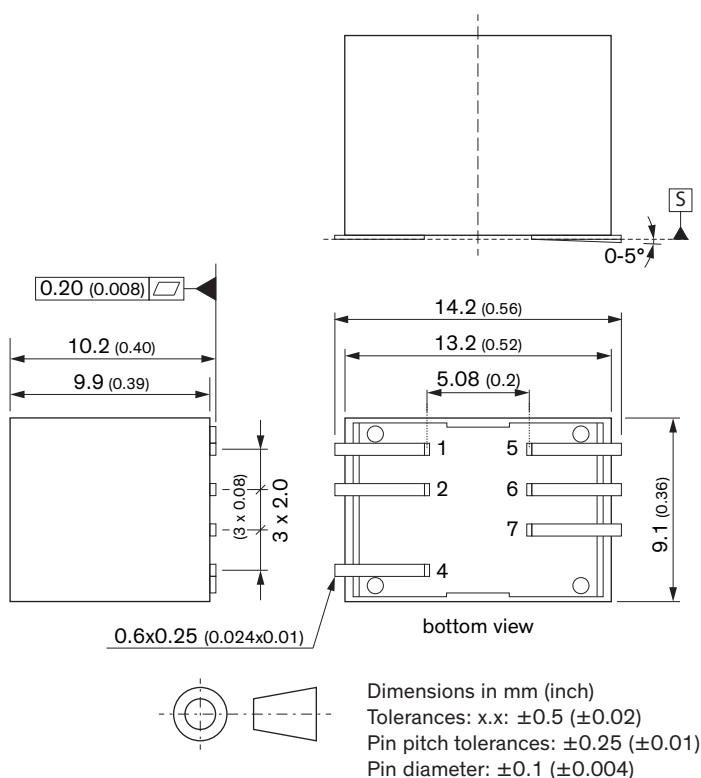
Frequently Asked Questions

www.tracopower.com/glossary-faq

Glossary

www.tracopower.com/info/glossary.pdf

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

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

Recommended Solder Pad Layout

