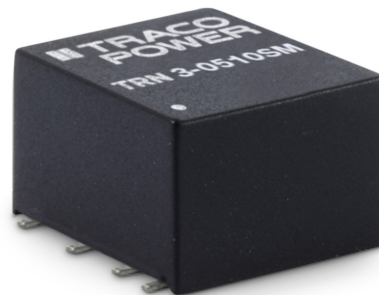


DC/DC Converter

TRN 3SM Series, 3 Watt

- Compact SMD package
11,9 × 11,3 × 8,0 mm
- Fully regulated outputs
- Input Voltage range
4.5-13.2, 9-18, 18-36, 36-75 VDC
- I/O-isolation 1'600 VDC
- Operating temperature range
-40°C to +85°C
- Short circuit protection
- 3-year product warranty



The TRN 3SM Series comprises 3 Watt fully regulated, high performance DC/DC converters. They come in a compact cubical package of only 1.07 cm³. Full load operation is reliable up to 85°C environment temperature. With 1'600 VDC I/O-isolation voltage, 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 (2:1) and minimum load is not required.

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TRN 3-0510SM	4.5 – 13.2 VDC (9 VDC nominal)	3.3 VDC	700 mA	75 %
TRN 3-0511SM		5.0 VDC	600 mA	78 %
TRN 3-0512SM		12 VDC	250 mA	82 %
TRN 3-0513SM		15 VDC	200 mA	80 %
TRN 3-0515SM		24 VDC	125 mA	80 %
TRN 3-0521SM		± 5.0 VDC	±300 mA	77 %
TRN 3-0522SM		±12 VDC	±125 mA	80 %
TRN 3-0523SM		±15 VDC	±100 mA	80 %
TRN 3-1210SM	9 – 18 VDC (12 VDC nominal)	3.3 VDC	700 mA	76 %
TRN 3-1211SM		5.0 VDC	600 mA	79 %
TRN 3-1212SM		12 VDC	250 mA	84 %
TRN 3-1213SM		15 VDC	200 mA	83 %
TRN 3-1215SM		24 VDC	125 mA	82 %
TRN 3-1221SM		± 5.0 VDC	±300 mA	78 %
TRN 3-1222SM		±12 VDC	±125 mA	82 %
TRN 3-1223SM		±15 VDC	±100 mA	81 %
TRN 3-2410SM	18 – 36 VDC (24 VDC nominal)	3.3 VDC	700 mA	76 %
TRN 3-2411SM		5.0 VDC	600 mA	78 %
TRN 3-2412SM		12 VDC	250 mA	84 %
TRN 3-2413SM		15 VDC	200 mA	84 %
TRN 3-2415SM		24 VDC	125 mA	83 %
TRN 3-2421SM		± 5.0 VDC	±300 mA	79 %
TRN 3-2422SM		±12 VDC	±125 mA	83 %
TRN 3-2423SM		±15 VDC	±100 mA	82 %
TRN 3-4810SM	36 – 75 VDC (48 VDC nominal)	3.3 VDC	700 mA	75 %
TRN 3-4811SM		5.0 VDC	600 mA	79 %
TRN 3-4812SM		12 VDC	250 mA	83 %
TRN 3-4813SM		15 VDC	200 mA	83 %
TRN 3-4815SM		24 VDC	125 mA	82 %
TRN 3-4821SM		± 5.0 VDC	±300 mA	77 %
TRN 3-4822SM		±12 VDC	±125 mA	82 %
TRN 3-4823SM		±15 VDC	±100 mA	80 %

Input Specifications

Input current no load	9 Vin models:	75 mA max.
	12 Vin models:	40 mA max.
	24 Vin models:	20 mA max.
	48 Vin models:	12 mA max.
Surge voltage (1 sec. max.)	9 Vin models:	15 V max.
	12 Vin models:	25 V max.
	24 Vin models:	50 V max.
	48 Vin models:	100 V max.
Reflected ripple current	9 Vin models:	100 mAp-p typ.
	12 & 24 Vin models:	75 mAp-p typ.
	48 Vin models:	50 mAp-p typ.
Conducted noise	– conducted input emission	EN 55032 class A or B with external components
EMC immunity	– 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
	– Conducted immunity	Nippon chemi-con KY 220 μ F/ 100 V
	– Magnetic field immunity	EN 61000-4-6, 10 Vrms, perf. criteria A
Input filter		capacitor type

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)		50 mVp-p typ.
Start-up time		15 ms max. (5 ms typ.)
Transient response (25% load step change)		500 μ s typ.
Short circuit protection		continuous, automatic recovery
Capacitive load	–Single output	3.3 VDC models: 4400 μ F max.
		5.0 VDC models: 2200 μ F max.
		12 VDC models: 1000 μ F max.
		15 VDC models: 820 μ F max.
		24 VDC models: 330 μ F max.
	–Dual output	± 5.0 VDC models: 1200 μ F max. (each output)
		± 12 VDC models: 520 μ F max. (each output)
		+15 VDC models: 440 μ F max. (each output)

General Specifications

Temperature ranges	– Operating (convection cooling 20LFM, 0,1m/s)	–40°C to +85°C
	– Case temperature	+95°C max.
	– Storage temperature	–55°C to +125°C
Derating		2.5%/K above 65°C
Humidity (non condensing)		5 – 95 % rel H max.
Isolation voltage	– I/O isolation voltage (60 sec.)	1'600 VDC
Isolation capacitance		75 pF max.
Isolation resistance (@ 500 VDC)		>1 Gohm

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

General Specifications

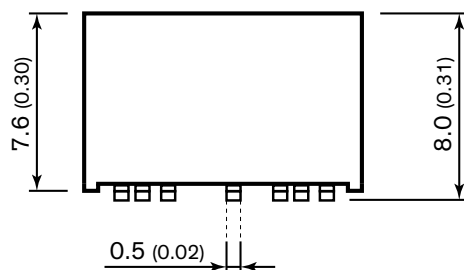
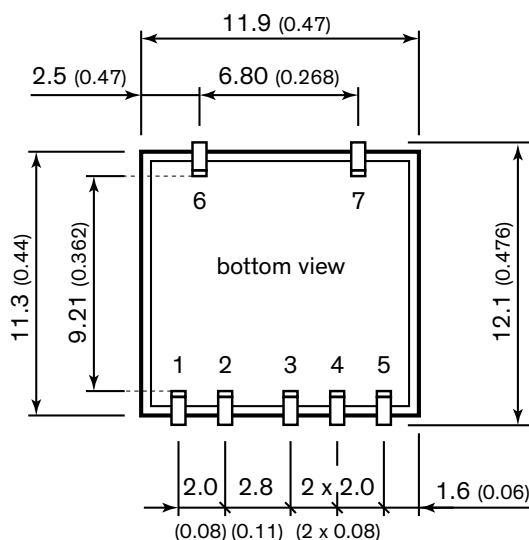
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)	4'400'000 h
Switching frequency	100 kHz min. Pulse frequency modulation.
Thermal shock & vibration	MIL-STD-810F
Safety standards	– Information technology IEC/EN 60950-1, UL 60950-1
Environmental compliance	– Reach – RoHS www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU

Physical Specifications

Casing material	non-conductive black plastic
Potting material	silicone (UL 94V-0 rated)
Package weight	2.1g (0.07oz)

Supporting Documents: www.tracopower.com/overview/trn3sm

Outline Dimensions



Pin-Out

Pin	Single	Dual
1	–Vin (GND)	–Vin (GND)
2	+Vin (Vcc)	+Vin (Vcc)
3	+Vout	+Vout
4	no pin	common
5	–Vout	–Vout
6	NC	NC
7	NC	NC

Dimensions in [mm], () = Inch

Tolerances: x.x	±0.5 (±0.02)
x.xx	±0.25 (±0.01)
Pin pitch tolerances	±0.25 (±0.01)
Pin dimension tolerance	±0.1 (±0.004)

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TRACO Power:

<u>TRN 3-4810SM</u>	<u>TRN 3-0510SM</u>	<u>TRN 3-0523SM</u>	<u>TRN 3-1222SM</u>	<u>TRN 3-1215SM</u>	<u>TRN 3-1210SM</u>	<u>TRN 3-2421SM</u>
<u>TRN 3-4815SM</u>	<u>TRN 3-2413SM</u>	<u>TRN 3-4811SM</u>	<u>TRN 3-2412SM</u>	<u>TRN 3-4812SM</u>	<u>TRN 3-2422SM</u>	<u>TRN 3-0521SM</u>
<u>TRN 3-1221SM</u>	<u>TRN 3-1212SM</u>	<u>TRN 3-4813SM</u>	<u>TRN 3-4822SM</u>	<u>TRN 3-0522SM</u>	<u>TRN 3-1223SM</u>	<u>TRN 3-2410SM</u>
<u>TRN 3-4821SM</u>	<u>TRN 3-1213SM</u>	<u>TRN 3-2415SM</u>	<u>TRN 3-1211SM</u>	<u>TRN 3-0511SM</u>	<u>TRN 3-2411SM</u>	<u>TRN 3-0513SM</u>
<u>TRN 3-4823SM</u>	<u>TRN 3-0512SM</u>	<u>TRN 3-0515SM</u>	<u>TRN 3-2423SM</u>			