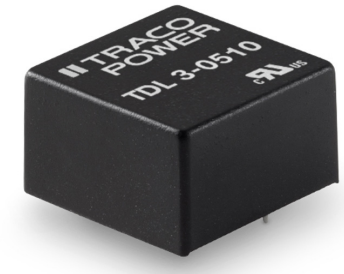
TRACO POWER

DC/DC Converter

TDL 3 Series, 3 Watt

- **Compact 3W Converter in DIP package**
- **I/O-isolation 1‘500 VDC**
- **Fully regulated outputs**
- **Wide 2 : 1 input voltage range**
- **Operating temperature range -40°C to +80°C**
- **Short circuit protection**
- **3-year product warranty**



The TDL 3 series with 2:1 input voltage range is a selection of 3 Watt regulated dc/dc-converters. They come in a very compact DIP package (0.55 × 0.55 × 0.31 inch).

Models

Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TDL 3-0510	**4.5 – 10 VDC** (5 VDC nominal)	3.3 VDC	600 mA	79 %
TDL 3-0511		5.0 VDC	600 mA	81 %
TDL 3-0512		12 VDC	250 mA	85 %
TDL 3-0513		15 VDC	200 mA	85 %
TDL 3-0521		±5.0 VDC	±300 mA	82 %
TDL 3-0522		±12 VDC	±125 mA	84 %
TDL 3-0523		±15 VDC	±100 mA	85 %
TDL 3-1210	**9 – 18 VDC** (12 VDC nominal)	3.3 VDC	600 mA	80 %
TDL 3-1211		5.0 VDC	600 mA	83 %
TDL 3-1212		12 VDC	250 mA	87 %
TDL 3-1213		15 VDC	200 mA	87 %
TDL 3-1221		±5.0 VDC	±300 mA	84 %
TDL 3-1222		±12 VDC	±125 mA	86 %
TDL 3-1223		±15 VDC	±100 mA	87 %
TDL 3-2410	**18 – 36 VDC** (24 VDC nominal)	3.3 VDC	600 mA	80 %
TDL 3-2411		5.0 VDC	600 mA	83 %
TDL 3-2412		12 VDC	250 mA	87 %
TDL 3-2413		15 VDC	200 mA	87 %
TDL 3-2421		±5.0 VDC	±300 mA	84 %
TDL 3-2422		±12 VDC	±125 mA	86 %
TDL 3-2423		±15 VDC	±100 mA	87 %
TDL 3-4810	**36 – 75 VDC** (48 VDC nominal)	3.3 VDC	600 mA	79 %
TDL 3-4811		5.0 VDC	600 mA	82 %
TDL 3-4812		12 VDC	250 mA	86 %
TDL 3-4813		15 VDC	200 mA	86 %
TDL 3-4821		±5.0 VDC	±300 mA	82 %
TDL 3-4822		±12 VDC	±125 mA	85 %
TDL 3-4823		±15 VDC	±100 mA	85 %

Input Specifications

Input current no load		5 Vin models:	45 mA typ.
		12 Vin models:	27 mA typ.
		24 Vin models:	16 mA typ.
		48 Vin models:	10 mA typ.
Surge voltage (1 sec. max.)		5 Vin models:	12 V max.
		12 Vin models:	25 V max.
		24 Vin models:	50 V max.
		48 Vin models:	100 V max.
Start-up voltage		5 Vin models:	4.5 VDC max.
		12 Vin models:	9.0 VDC max.
		24 Vin models:	18 VDC max.
		48 Vin models:	36 VDC max.
Input filter			internal capacitor
Conducted noise			EN 55022 class A or B (with ext. 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 220µF/100V
Conducted immunity			EN 61000-4-6, 10 Vrms, perf. criteria A
Magnetic field immunity			EN 61000-4-8, 3 A/m, perf. criteria A

Output Specifications

Voltage set accuracy			±1.5 % max.
Voltage balance (dual output models)			2 % max.
Regulation	– Input variation		0.2 % max.
	– Load variation 0 – 100 %		1 % max.
		dual output:	2 % max. (balanced load)
		cross regulation - dual output:	5 % max. (asymmetrical load 25 % / 100 %)
Minimum load			no minimum load required
Ripple and noise (20 MHz Bandwidth)			70 mVp-p typ.
Transient response	– Recovery time (25% load step change)		500 µs max.
	– Response deviation (25% load step change)		5 % max.
Short circuit protection			continuous, automatic recovery
Over load protection			at 170 % of Iout nom. (foldback)
Capacitive load	–Single output	all models:	100 µF max.
	–Dual output	all models:	100 µF max. (each output)

General Specifications

Temperature ranges	– Operating (convection cooling 20LFM, 0,1m/s)	–40°C to +70°C (without derating)
	– Case temperature	+95°C max.
	– Storage temperature	–50°C to +125°C
Derating		4.0 %/K above 70°C
Humidity (non condensing)		95 % rel H max.
Isolation voltage	– I/O isolation voltage (60 sec.)	1'500 VDC
Isolation capacitance (input/output)		100 pF typ.
Isolation resistance (input/output)		>1 Gohm
Altitude during operation		5'000 m
Temperature coefficient		±0.02 %/K max.

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

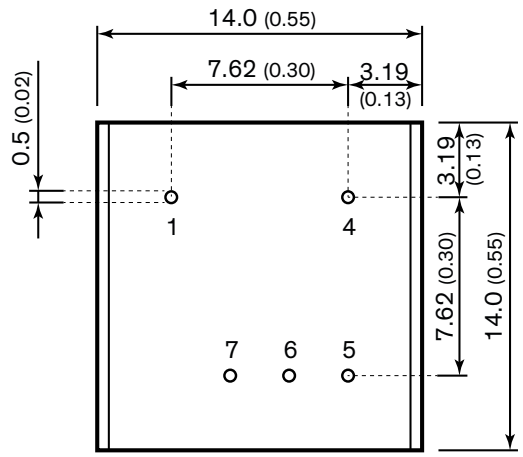
General Specifications (continued)

Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		>3‘450‘000 h
Switching frequency		100 kHz min.
Safety standards		UL 60950-1 IEC/EN 60950-1
	– Certification documents	www.tracopower.com/overview/tdl3
Environmental compliance	– Reach	www.tracopower.com/products/reach-declaration.pdf
	– RoHS	RoHS directive 2011/65/EU

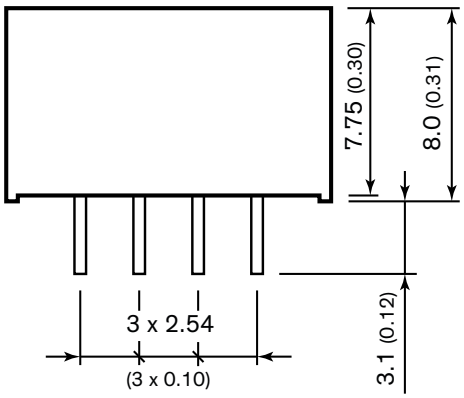
Physical Specifications

Casing material	non-conducting black plastic (UL 94V-0 rated)
Potting material	Silicone (UL 94V-0 rated)
Pin material	tinned copper
Package weight	3.9 g (0.137 oz)
Soldering temperature	max. 260°C / 10 sec.

Outline Dimensions



bottom view



Pin-Out		
Pin	**Single**	**Dual**
1	–Vin (GND)	–Vin (GND)
4	+Vin (Vcc)	+Vin (Vcc)
5	+Vout	+Vout
6	no pin	Common
7	–Vout	–Vout

Dimensions in [mm], () = Inch

Tolerances: x.x	±0.5 (±0.02)
x.xx	±0.25(±0.01)
pin dimension tolerance	±0.05 (±0.002)

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