



**THE DATASHEET OF
TDL 3-2412**



- 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 all models: Nippon chemi-con KY 220 μ F/100V -external input capacitor
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 μ s max. - Response deviation (25% load step change): 5 % max.
Short circuit protection	continuous, automatic recovery
Over load protection	at 170% of lout nom. (foldback)
Capacitive load	-Single output: all models: 100 μ F max. -Dual output: all models: 100 μ F 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 www.tracopower.com/overview/tdl3
Environmental compliance	– Reach – RoHS www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU

Physical Specifications

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

Outline Dimensions



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)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View TDL 3-2412 on WIN SOURCE](#)
-  [Traco Power Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management