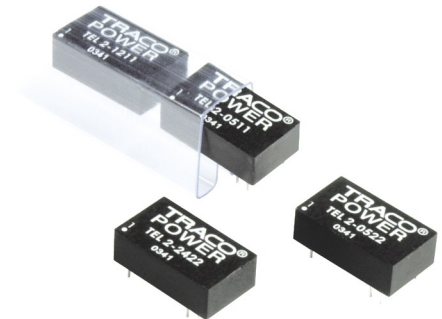




#### Features

- ◆ Ultracompact DIL-16 Plastic Package
- ◆ Wide 2:1 Input Range
- ◆ Regulated Output
- ◆ I/O-Isolation 1500V
- ◆ Input Filter meets EN55022A without ext. Components
- ◆ Low Ripple and Noise
- ◆ Indefinite Shortcircuit Protection
- ◆ Operating Temperature Range -25°C to +75°C
- ◆ Lead free Design, RoHS compliant
- ◆ 3 Year Product Warranty



The TEL-2 series, comprising 28 models, is a range of isolated 2 Watt converters in a low profile DIL-16 package. Requiring only 3.25 cm<sup>2</sup> of space on the PCB they provide a complete DC/DC converter without need of any external components. Wide input range and tightly regulated output voltage qualifies these converters for many cost critical applications in industrial and consumer electronics.

#### Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEL 2-0510	4.5 – 9 VDC	3.3 VDC	500 mA	70 %
TEL 2-0511		5 VDC	400 mA	73 %
TEL 2-0512		12 VDC	165 mA	75 %
TEL 2-0513		15 VDC	135 mA	73 %
TEL 2-0521		± 5 VDC	± 200 mA	64 %
TEL 2-0522		± 12 VDC	± 85 mA	69 %
TEL 2-0523		± 15 VDC	± 65 mA	71 %
TEL 2-1210	9 – 18 VDC	3.3 VDC	500 mA	73 %
TEL 2-1211		5 VDC	400 mA	77 %
TEL 2-1212		12 VDC	165 mA	80 %
TEL 2-1213		15 VDC	135 mA	80 %
TEL 2-1221		± 5 VDC	± 200 mA	73 %
TEL 2-1222		± 12 VDC	± 85 mA	78 %
TEL 2-1223		± 15 VDC	± 65 mA	78 %
TEL 2-2410	18 – 36 VDC	3.3 VDC	500 mA	72 %
TEL 2-2411		5 VDC	400 mA	77 %
TEL 2-2412		12 VDC	165 mA	80 %
TEL 2-2413		15 VDC	135 mA	81 %
TEL 2-2421		± 5 VDC	± 200 mA	74 %
TEL 2-2422		± 12 VDC	± 85 mA	78 %
TEL 2-2423		± 15 VDC	± 65 mA	80 %
TEL 2-4810	36 – 75 VDC	3.3 VDC	500 mA	71 %
TEL 2-4811		5 VDC	400 mA	73 %
TEL 2-4812		12 VDC	165 mA	79 %
TEL 2-4813		15 VDC	135 mA	79 %
TEL 2-4821		± 5 VDC	± 200 mA	71 %
TEL 2-4822		± 12 VDC	± 85 mA	77 %
TEL 2-4823		± 15 VDC	± 65 mA	77 %

**Input Specifications**

Input current at full load / full load (nominal input)	5 Vin models:	600 mA/ 40 mA typ.
	12 Vin models:	220 mA/ 20 mA typ.
	24 Vin models:	110 mA/ 10 mA typ.
	48 Vin models:	55 mA/ 8 mA typ.
Start-up voltage / under voltage shut down  under voltage shut down	5 Vin models:	4 VDC / 3.5 VDC typ.
	12 Vin models:	7 VDC / 6.5 VDC typ.
	24 Vin models:	12 VDC / 11 VDC typ.
	48 Vin models:	24 VDC / 22 VDC typ.
Surge voltage (100 msec. max.)	5 Vin models:	11 V max.
	12 Vin models:	25 V max.
	24 Vin models:	50 V max.
	48 Vin models:	100 V max.
Reverse voltage protection		1.0 A max.
Conducted noise (input)		EN 55022 level A, FCC part 15, level A

**Output Specifications**

Voltage set accuracy		± 2 % max.
Regulation	– Input variation Vin min. to Vin max.	± 0.5 % max.
	– Load variation 25 – 100 %	single output models: ± 0.75 % max.
		dual output models: ± 2.0% (balanced load)
Ripple and noise (20 MHz Bandwidth)		50 mVpk-pk max
Temperature coefficient		± 0.02 %/K
Short circuit protection		indefinite, automatic recovery
Minimum load		25% of rated max current (operation at lower load condition is safe but a higher output ripple will be experienced)
Capacitive load	3.3 VDC output models:	2'200 µF max.
	5 VDC output models:	1'000 µF max.
	12 VDC output models:	170 µF max.
	15 VDC output models:	110 µF max.
	± 5 VDC output models:	470 µF max.
	± 12 VDC output models:	100 µF max.
	± 15 VDC output models:	47 µF max.

**General Specifications**

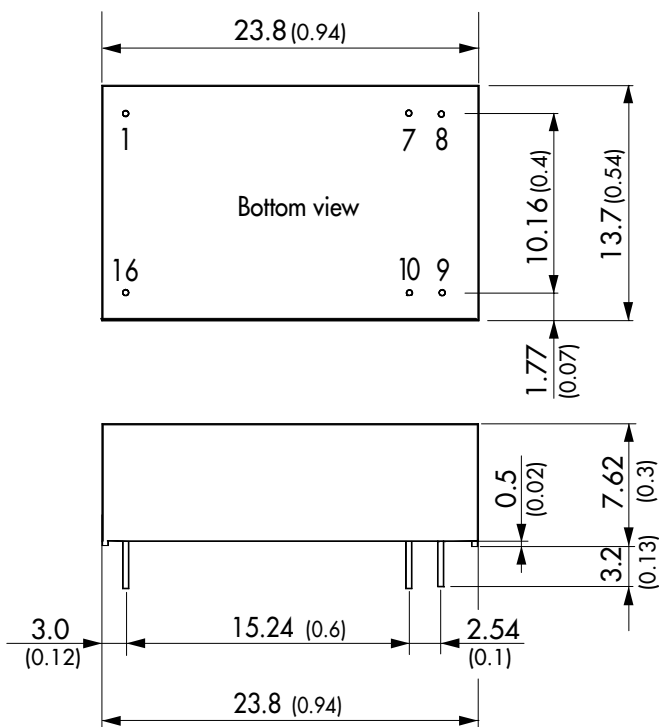
Temperature ranges	– Operating	– 25 °C ... + 75 °C (no derating)
	– Storage	– 55 °C ... + 125 °C
Humidity (non condensing)		95 % rel. H max.
Reliability, calculated MTBF (MIL-HDBK-217 F)		> 1.2 Mio h @ 25°C
Isolation voltage	Input/Output	1'500 VDC
Isolation capacity	Input/Output	250 pF max.
Isolation resistance	Input/Output (500 VDC)	> 1'000 M Ohm
Switching frequency		300 kHz (PFM)
Safety standards		UL/cUL 60950 , IEC 60950, EN 60950
Safety approval		CSA 60950-1-03 (File no. 226037)

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

**Physical Specifications**

Case material	non conductive FR4
Potting material	epoxy, UL94V-0 - rated
Weight	5.1 g (0.17oz)
Soldering temperature	max. 265°C / 10 sec.

**Outline Dimensions mm (inches)**



Pin-Out		
Pin	Single	Dual
1	-Vin (GND)	-Vin (GND)
7	No con.	No con.
8	No con.	Common
9	+Vout	+Vout
10	-Vout	-Vout
16	+Vin	+Vin

Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02)  $\pm 0.002$   
Tolerances  $\pm 0.25$  (0.01)

Specifications can be changed without notice