DC/DC Converters

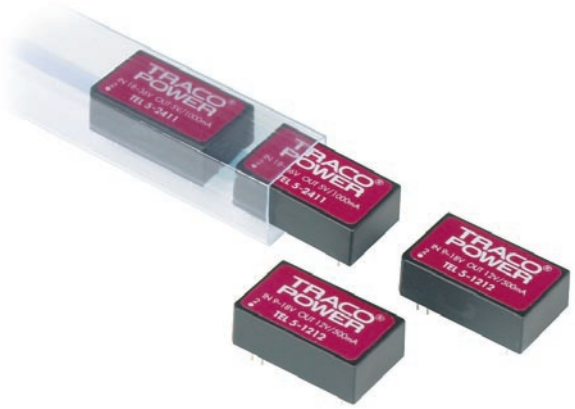
TEL 5 Series, 5 Watt

CB Scheme

UL 60950-1

Features

- Wide 2:1 input range
- Cost efficient SMD-design
- High power density
- High efficiency up to 86%
- Regulated outputs
- I/O isolation 1'500 VDC
- Indefinite short-circuit protection
  24-pin DIP with industry standard pinout
- High reliability, MTBF >1 Mio. h
- Internal EMI filter to comply with
  EN 55022, class A (optional)
- Lead free design, RoHS compliant
- 3-year product warranty



The TEL 5 Series is a range of DC/DC-converter modules with wide input range of 2:1. State of the art SMD-technology guarantees a product with very high reliability and excellent cost /performance ratio. High efficiency allows an operating temperature range of –40°C to +85°C at full load. This product series provides an economical solution for many cost critical applications in industrial and consumer electronics.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEL 5-1210	9 – 18 VDC (nominal 12 VDC)	3.3 VDC	1200 mA	77 %
TEL 5-1211		5 VDC	1000 mA	81 %
TEL 5-1212		12 VDC	500 mA	84 %
TEL 5-1222		±12 VDC	±250 mA	84 %
TEL 5-1223		±15 VDC	±200 mA	84 %
TEL 5-2410	18 – 36 VDC (nominal 24 VDC)	3.3 VDC	1200 mA	79 %
TEL 5-2411		5 VDC	1000 mA	83 %
TEL 5-2412		12 VDC	500 mA	86 %
TEL 5-2422		±12 VDC	±250 mA	86 %
TEL 5-2423		±15 VDC	±200 mA	86 %

Input Specifications

Input current no load /full load	12 Vin models: 24 Vin models:	20 mA / 590 mA typ. 5 mA / 290 mA typ.
Start-up voltage / under voltage shut down	12 Vin models: 24 Vin models:	8.0 VDC / 8.0 VDC 16.0 VDC / 16.0 VDC
Surge voltage (1 sec. max.)	12 Vin models: 24 Vin models:	25 V max. 50 V max.
Reverse voltage protection		1.0 A max.

Output Specifications

Voltage set accuracy		±1 %
Regulation	– Input variation Vin min. to Vin max. – Load variation 20 – 100 % single output models dual output models balanced load	0.3 % max. 1 % max 2 % max.
Ripple and noise (20 MHz Bandwidth)		75 mVpk-pk max.
Temperature coefficient		±0.02 %/K
Output current limitation		>120 % of Iout max., constant current
Short circuit protection		continuous (automatic recovery)
Capacitive load	single output models: dual output models:	6800 µF max. 1000 µF max. (each output)

General Specifications

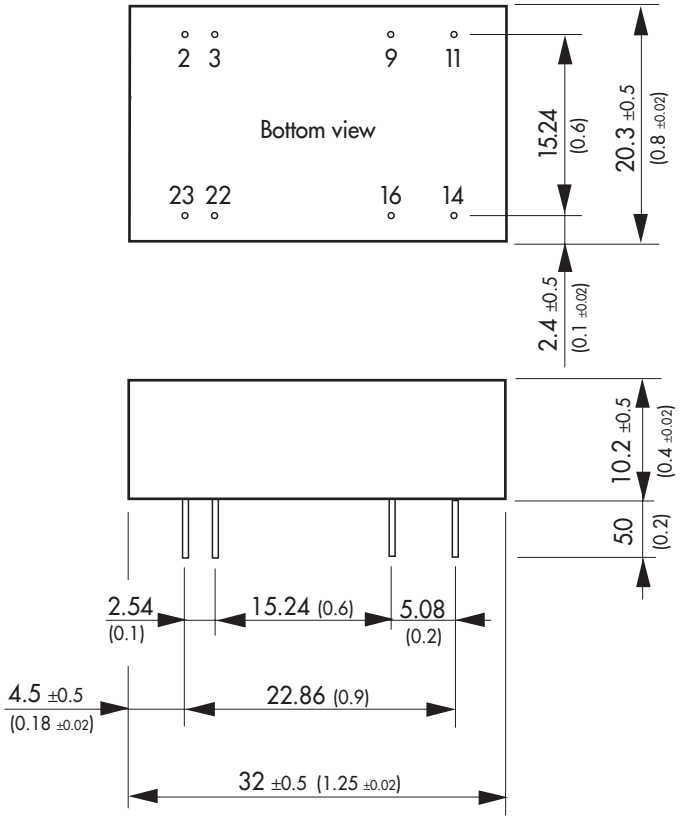
Temperature ranges	– Operating – Case temperature – Storage	–40°C to +85°C +90°C –40°C to +125°C
Derating (convection cooling)		3.3 %/K above 70°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F @ 25°C, ground benign)		>1 Mio. h
Isolation voltage (60 sec)	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	380 pF typ.
Isolation resistance	– Input/Output (500 VDC)	>1'000 M Ohm
Switching frequency		300 kHz typ.
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals		CSA File No. 226037 http://directories.csa-international.org

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

Physical Specifications

Casing material	non conductive plastic (UL 94V-0 rated)
Weight	17 g (0.60 oz)
Soldering temperature	max. 265°C / 10 sec.

Outline Dimensions mm (inches)



Pin-Out

Pin	Single	Dual
2	–Vin (GND)	–Vin (GND)
3	–Vin (GND)	–Vin (GND)
9	No pin	Common
11	No con.	–Vout
14	+Vout	+Vout
16	–Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

Pin diameter ⌀ 0.5 ±0.05 (0.02 ±0.002)
Tolerances ±0.5 (±0.02)