

- Ultra compact 8 W converter in DIP-16 metal casing
- Operating temperature range -40°C to +80°C
- Wide 2:1 input range
- Fully regulated outputs
- Protection against short circuit
- Built-In EN 55022 class A filter
- 3-year product warranty



The TEL 8 series is a range of isolated 8 Watt converters which come in a very compact DIP-16 metal package. They offer a 2:1 input voltage range and feature a high efficiency of up to 86% which allows an operation temperature of up to +70°C at full load. An internal input filter makes the converters comply with conducted emission EN55022 class A.

The TEL 8 Series models are an economical solution for space critical and cost sensitive applications in instrumentation, IT and industrial electronics.

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TEL 8-1210	9 - 18 VDC (nominal 12 VDC)	3.3 VDC	1600 mA	78 %
TEL 8-1211		5.0 VDC	1600 mA	81 %
TEL 8-1212		12 VDC	665 mA	84 %
TEL 8-1213		15 VDC	535 mA	84 %
TEL 8-1215		24 VDC	335 mA	85 %
TEL 8-1222		±12 VDC	±335 mA	85 %
TEL 8-1223		±15 VDC	±265 mA	84 %
TEL 8-2410	18 - 36 VDC (nominal 24 VDC)	3.3 VDC	1600 mA	78 %
TEL 8-2411		5.0 VDC	1600 mA	82 %
TEL 8-2412		12 VDC	665 mA	85 %
TEL 8-2413		15 VDC	535 mA	85 %
TEL 8-2415		24 VDC	335 mA	86 %
TEL 8-2422		±12 VDC	±335 mA	85 %
TEL 8-2423		±15 VDC	±265 mA	86 %
TEL 8-4810	36 - 75 VDC (nominal 48 VDC)	3.3 VDC	1600 mA	78 %
TEL 8-4811		5.0 VDC	1600 mA	81 %
TEL 8-4812		12 VDC	665 mA	85 %
TEL 8-4813		15 VDC	535 mA	85 %
TEL 8-4815		24 VDC	335 mA	86 %
TEL 8-4822		±12 VDC	±335 mA	86 %
TEL 8-4823		±15 VDC	±265 mA	86 %

## Input Specifications

Input current no load	12 Vin models: 10 mA typ. 24 Vin models: 10 mA typ. 48 Vin models: 8 mA typ.
Surge voltage (1 sec. max.)	12 Vin models: 25 V max. 24 Vin models: 50 V max. 48 Vin models: 100 V max.
Start-up voltage	12 Vin models: 9 VDC (or lower) 24 Vin models: 18 VDC (or lower) 48 Vin models: 36 VDC (or lower)
Under voltage shut down	12 Vin models: 8 VDC typ. 24 Vin models: 16 VDC typ. 48 Vin models: 34 VDC typ.
Conducted noise	EN55022 class A (internal filter)
ESD (electrostatic discharge)	EN 61000-4-2, air $\pm 8$ kV, contact $\pm 6$ kV, perf. criteria A
Radiated immunity	EN 61000-4-3, 10 V/m, perf. criteria A
Fast transient / surge (with external input capacitor) – External input capacitor	EN 61000-4-4, $\pm 2$ kV, perf. criteria A EN 61000-4-5, $\pm 1$ kV perf. criteria A 220 $\mu$ F / 100 V
Conducted immunity	EN 61000-4-6, 10 Vrms, perf. criteria A

## Output Specifications

Voltage set accuracy	$\pm 2$ % max.
Voltage balance (dual output models)	2 % max.
Regulation – Input variation – Load variation 0 – 100 %	0.8 % max. 1 % max.
Minimum load	not required
Ripple and noise (20 MHz Bandwidth)	55 mVp-p max.
Transient Response (25% load step change) – Recovery time – Deviation	500 $\mu$ s max. $\pm 5.0$ % max.
Current limitation	at 150 % typ. of Iout max.
Short circuit protection	hiccup mode, automatic recovery
Capacitive load – Single output 3.3 & 5.0 VDC models: 12 & 15 VDC models: 24 VDC models: – Dual output $\pm 12$ & $\pm 15$ VDC models:	680 $\mu$ F max. 330 $\mu$ F max. 150 $\mu$ F max. 150 $\mu$ F max. (each output)

## General Specifications

Temperature ranges – Operating (convection cooling 20LFM, 0,1m/s) – Case temperature – Storage temperature	–40°C to +80°C +105°C max. –50°C to +125°C
Derating	5 %/K above 70°C
Humidity (non condensing)	95 % rel H max.
Isolation voltage – Isolation test voltage (tested for 1 sec.) – I/O isolation voltage (60 sec.)	1'800 Vpk 1'500 VDC
Isolation capacitance (input/output)	500 pF typ.
Isolation resistance (input/output)	>1 Gohm
Altitude during operation	4000 m
Temperature coefficient	$\pm 0.02$ %/K typ.

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

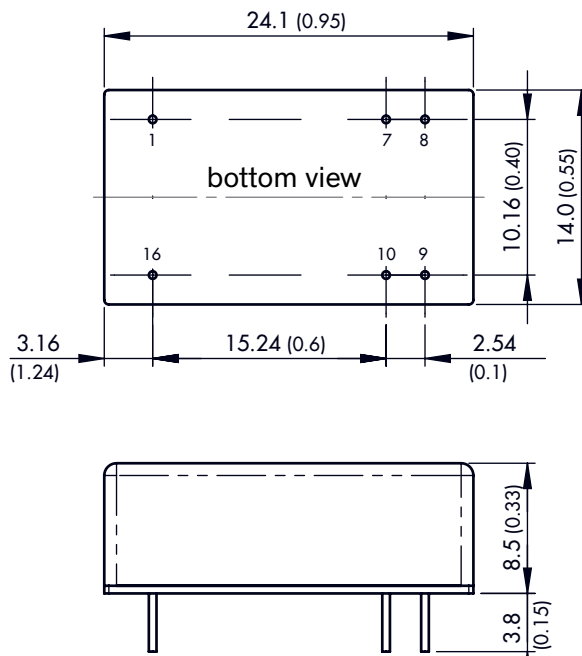
## General Specifications

Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)	>1'000'000 h
Switching frequency	370 kHz typ.
Safety standards /approvals	IEC/EN 60950-1 UL 60950-1
– Certification documents	
Environmental compliance	– Reach – RoHS
	RoHS directive 2011/65/EU

## Physical Specifications

Casing material	aluminium alloy, black anodized coating
Pin material	tinned copper
Package weight	6.1 g (0,22 oz)
Soldering temperature	max. 260°C / 10 sec.

## Outline Dimensions



Pin-Out		
Pin	Single	Dual
1	-Vin (GND)	-Vin (GND)
7	ntc	ntc
8	ntc	Common
9	+Vout	+Vout
10	-Vout	-Vout
16	+Vin	+Vin

ntc = not to connect

Dimensions in [mm], ( ) = Inch  
Tolerances:  $\pm 0.5$  (0.02)  
Pin pitch tolerance:  $\pm 0.25$  (0.01)  
Pin diameter:  
0.5 (0.02)  $\pm 0.05$  (0.002)