

- 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 and overload condition
- Built-In EN 55032 class A filter



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 EN 55032 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	<b>9 - 18 VDC</b> (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	<b>18 - 36 VDC</b> (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	<b>36 - 75 VDC</b> (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.
EMC emissions	– Conducted RI suppression on input EN 55032 class A (internal filter)
EMC immunity	EN 55024 – ESD (electrostatic discharge) EN 61000-4-2, ±8 kV/±6 kV, perf. criteria A – Radiated immunity EN 61000-4-3, 10 V/m, perf. criteria A – Fast transient / surge EN 61000-4-4, ±2 kV, perf. criteria A (with external input capacitor) EN 61000-4-5, ±1 kV perf. criteria A External input capacitor: Nippon chemi-con KY 220 µF / 100 V – 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	±2 % max.
Voltage balance (dual output models)	2 % max.
Regulation	– Input variation 0.8 % max. – Load variation 0 – 100 % 1 % max.
Minimum load	not required
Temperature coefficient	±0.02 %/K typ.
Ripple and noise (20 MHz Bandwidth)	55 mVp-p max.
Transient Response	– Recovery time (25% load step change) 500 µs max. – Deviation ±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: 680 µF max. 12 & 15 VDC models: 330 µF max. 24 VDC models: 150 µF max. –Dual output ±12 & ±15 VDC models: 150 µF max. (each output)

## General Specifications

Temperature ranges	– Operating (convection cooling 20LFM, 0,1m/s) –40°C to +80°C – Case temperature +105°C max. – Storage temperature –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.) 1'800 Vpk – I/O isolation voltage (60 sec.) 1'500 VDC
Isolation capacitance (input/output)	500 pF typ.
Isolation resistance (input/output)	>1 Gohm
Altitude during operation	5000 m

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

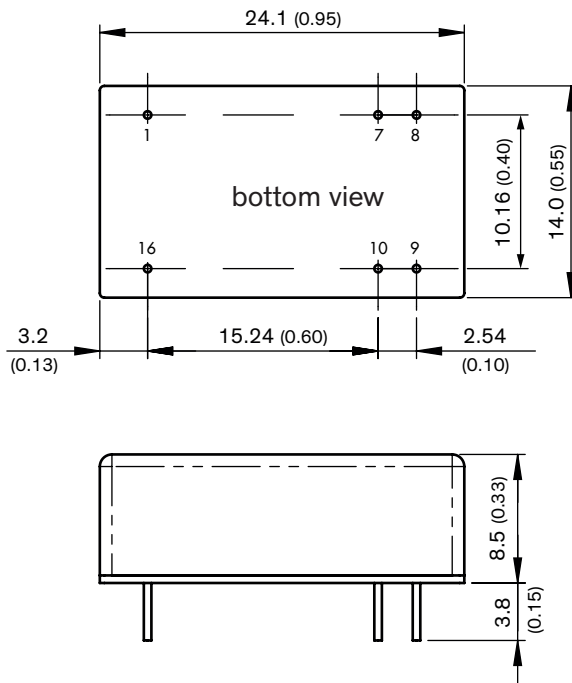
### General Specifications

Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)	1'000'000 h min.
Switching frequency	370 kHz typ.
Safety standards /approvals	IEC/EN 60950-1 UL 60950-1
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)