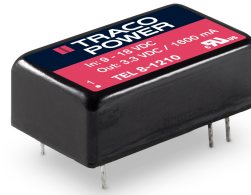


- Ultra compact 8 W converter in DIP-16 metal casing
- Operating temperature range -40°C to +80°C
- Wide 2:1 input range
- Built-in EN 55032 class A filter
- Protection against short circuit
- 3-year product warranty



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 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 Range	Output 1		Output 2		Efficiency typ.	
		Vnom	I _{max}	Vnom	I _{max}		
TEL 8-1210	9 - 18 VDC (12 VDC nom.)	3.3 VDC	1'600 mA			78 %	
TEL 8-1211		5 VDC	1'600 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		-12 VDC	335 mA	85 %
TEL 8-1223		+15 VDC	265 mA		-15 VDC	265 mA	84 %
TEL 8-2410	18 - 36 VDC (24 VDC nom.)	3.3 VDC	1'600 mA			78 %	
TEL 8-2411		5 VDC	1'600 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		-12 VDC	335 mA	85 %
TEL 8-2423		+15 VDC	265 mA		-15 VDC	265 mA	86 %
TEL 8-4810	36 - 75 VDC (48 VDC nom.)	3.3 VDC	1'600 mA			78 %	
TEL 8-4811		5 VDC	1'600 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		-12 VDC	335 mA	86 %
TEL 8-4823		+15 VDC	265 mA		-15 VDC	265 mA	86 %

Input Specifications

Input Current	- At no load	12 Vin models: 10 mA typ. 24 Vin models: 10 mA typ. 48 Vin models: 8 mA typ.
	- At full load	12 Vin models: 760 mA typ. 24 Vin models: 380 mA typ. 48 Vin models: 190 mA typ.
Surge Voltage		12 Vin models: 25 VDC max. (1 s max.) 24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.)
Under Voltage Lockout		12 Vin models: 8 VDC typ. 24 Vin models: 16 VDC typ. 48 Vin models: 34 VDC typ.
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Pi-Type

Output Specifications

Voltage Set Accuracy		±2% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models: 0.8% max. dual output models: 0.8% max.
	- Load Variation (0 - 100%)	single output models: 1% max. dual output models: 2% max. (Output 1) 2% max. (Output 2)
Ripple and Noise	- 20 MHz Bandwidth	55 mVp-p max.
Capacitive Load	- single output	3.3 Vout models: 680 µF max. 5 Vout models: 680 µF max. 12 Vout models: 330 µF max. 15 Vout models: 330 µF max. 24 Vout models: 150 µF max.
	- dual output	12 / -12 Vout models: 150 / 150 µF max. 15 / -15 Vout models: 150 / 150 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		150% typ. of Iout max.
Transient Response	- Response Deviation	5% max. (25% Load Step)
	- Response Time	500 µs max. (25% Load Step)

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents	www.tracopower.com/overview/tel8
Pollution Degree		PD 2

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55032 class A (internal filter)
	- Radiated Emissions	EN 55032 class A (with external filter)
	External filter proposal:	www.tracopower.com/overview/tel8

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

EMS Immunity		EN 55024 (IT Equipment) EN 55035 (Multimedia)
	- Electrostatic Discharge	Air: EN 61000-4-2, ± 8 kV, perf. criteria A
	- RF Electromagnetic Field	Contact: EN 61000-4-2, ± 6 kV, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-3, 10 V/m, perf. criteria A
		EN 61000-4-4, ± 2 kV, perf. criteria A
		EN 61000-4-5, ± 1 kV, perf. criteria A
		Ext. input component: KY 220 μ F
	- Conducted RF Disturbances	EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous: EN 61000-4-8, 100 A/m, perf. criteria A

General Specifications

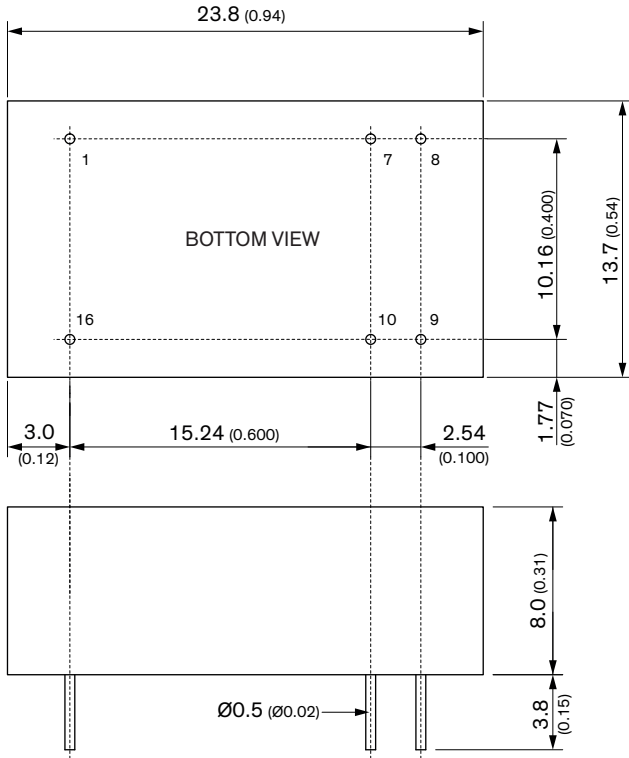
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +80°C
	- Case Temperature	+105°C max.
	- Storage Temperature	-50°C to +125°C
Power Derating	- High Temperature	5 %/K above 70°C
		See application note: www.tracopower.com/overview/tel8
Cooling System		Natural convection (20 LFM)
Altitude During Operation		6'000 m max.
Switching Frequency		370 kHz typ. (PWM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	1'500 VDC
	- Input to Output, 1 s	1'800 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 M Ω min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	500 pF typ.
Reliability	- Calculated MTBF	1'000'000 h (MIL-HDBK-217F, ground benign)
Washing Process		According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Housing Material		Alu alloy, black anodized coating
Potting Material		Epoxy (UL 94 V-0 rated)
Pin Material		Copper Alloy (C6801)
Pin Foundation Plating		Nickel (2 - 4 μ m)
Pin Surface Plating		Tin (3 - 5 μ m), matte
Housing Type		Metal Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		DIP16
Soldering Profile		Wave Soldering 260°C / 10 s max.
Weight		6.1 g
Environmental Compliance	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.)

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tel8
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All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Outline Dimensions



Dimensions in mm (inch)
 Tolerances: x.x ±0.5 (x.xx ±0.02)
 x.xx ±0.25 (x.xxx ±0.01)
 Pin diameter tolerances: x.x ±0.05 (x.xx ±0.002)

Pinout		
Pin	Single	Dual
1	-Vin (GND)	-Vin (GND)
7	NC	NC
8	NC	Common
9	+Vout	+Vout
10	-Vout	-Vout
16	+Vin (Vcc)	+Vin (Vcc)

NC: Not connected