THE DATASHEET OF

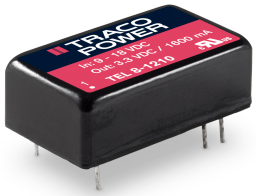
TEL 8-4815

TRACO POWER

DC/DC Converter

TEL 8 Series, 8 Watt

- **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**



UL 62368-1 IEC 62368-1

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
		Vnom	Imax	Vnom	Imax	typ.
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

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
		Contact:	EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 20 V/m, perf. criteria A
	- EFT (Burst) / Surge		EN 61000-4-4, ±2 kV, perf. criteria A
			EN 61000-4-5, ±1 kV, perf. criteria A
		Ext. input component:	KY 220 µF
	- 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
		1 s:	EN 61000-4-8, 1000 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 MΩ 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 µm)
Pin Surface Plating		Tin (3 - 5 µm), matte
Housing Type		Metal Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		DIP16
Soldering Profile		Lead-Free 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).)
	- SCIP Reference Number	acb7a2a8-642b-4cb3-846a-35a2f5870898

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tel8

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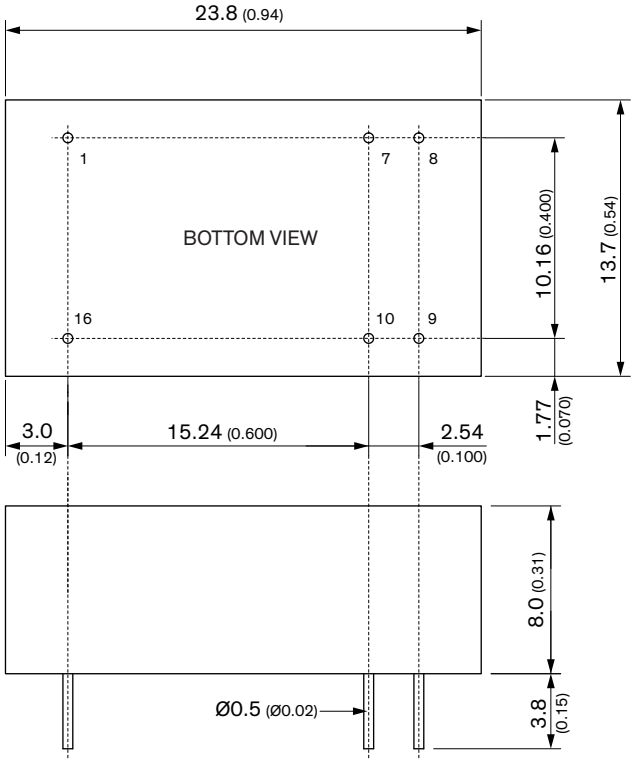
Outline Dimensions



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

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