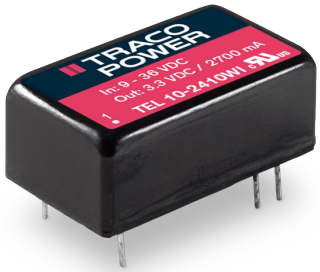
DC/DC Converter

TEL 10WI Series, 10 Watt

- **Most compact 10 Watt converter in DIP-16 metal casing**
- **Highest power density of 3.83 W/cm³**
- **6-side shielded metal case with insulated base plate**
- **Ultra wide 4:1 input voltage range**
- **High efficiency for low thermal loss**
- **Operating temperature range of -40°C to +88°C**
- **Built-in EN 55032 class A filter**
- **Current limitation and protection against short circuit**
- **3 years product warranty**



c UL us
UL 62368-1
UL 60950-1

The TEL 10WI series is a range of isolated 10 Watt converters which come in a ultra compact DIP-16 metal package. The design purpose of these series was to miniaturized low power DC/DC converters to the maximum without sacrifing high efficency. The TEL 10WI series sets the new standart for power density with 3.83 W/cm³.

The TEL 10WI series offer an ultra wide 4:1 input voltage range and feature a high efficiency of up to 86% which enables an operation temperature of up to +70°C at full load and up to 88°C with 50% load.

The converters have an internal input filter to comply with conducted emission EN 55032 / EN 55022 class A. The TEL 10WI 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 10-2410WI	**9 - 36 VDC** (nominal 24 VDC)	3.3 VDC	2700 mA	80 %
TEL 10-2411WI		5.1 VDC	2000 mA	83 %
TEL 10-2412WI		12 VDC	833 mA	87 %
TEL 10-2413WI		15 VDC	666 mA	88 %
TEL 10-2415WI		24 VDC	416 mA	88 %
TEL 10-2422WI		±12 VDC	±416 mA	87 %
TEL 10-2423WI		±15 VDC	±333 mA	87 %
TEL 10-4810WI	**18 - 75 VDC** (nominal 48 VDC)	3.3 VDC	2700 mA	80 %
TEL 10-4811WI		5.1 VDC	2000 mA	83 %
TEL 10-4812WI		12 VDC	833 mA	87 %
TEL 10-4813WI		15 VDC	666 mA	88 %
TEL 10-4815WI		24 VDC	416 mA	88 %
TEL 10-4822WI		±12 VDC	±416 mA	87 %
TEL 10-4823WI		±15 VDC	±333 mA	87 %

Input Specifications

Input current at no load		24 Vin models: 48 Vin models:	10 mA typ. 7 mA typ.
Surge voltage (1 s max.)		24 Vin models: 48 Vin models:	50 V max. 100 V max.
Start up voltage		24 Vin models: 48 Vin models:	9 V (or lower) 18 V (or lower)
Under voltage shut down		24 Vin models: 48 Vin models:	8 V typ. / 7 V min. 16 V typ. / 15 V min.
Input filter			internal Pi type
Recommended input fuse		24 Vin models: 48 Vin models:	2 A (slow blow type) 1 A (slow blow type)
Conducted noise			EN 55032, FCC part 15 class A without external components class B with external components
EMC immunity			EN 55024
	– ESD (electrostatic discharge)		EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
	– Radiated immunity		EN 61000-4-3, 20 V/m, perf. criteria A
	– Fast transient / surge (with external components)		EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±2 kV perf. criteria A
		24 Vin models:	Pi-type: 2 pcs. 470uF/50V CHEMI-CON KY Series & 1 pcs. 10uH/2.2A/0.1Ohm inductor: 732774100
		48 Vin models:	1 pcs. 470uF/100V CHEMI-CON KY Series
	– Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A
	– Magnetic field immunity		EN 61000-4-8, 100 A/m, perf. criteria A

Output Specifications

Voltage set accuracy			±1 % max.
Regulation	– Input variation (Vin min. to Vin max.)		0.2 % typ. / 0.8 % max.
	– Load variation (0 – 100 %)	single output:	1 % max.
		dual output:	1 % max. (balanced load)
	– Output voltage balance	dual output:	1 % typ. / 2 % max. (balanced load)
	– Cross regulation	dual output:	5 % max. (asymmetrical load 25 % / 100 %)
Temperature coefficient			±0.02 %/K max.
Ripple and noise (20 MHz Bandwidth)		3.3 & 5.1 Vout models: other output models:	60 mVp-p typ. / 75 mVp-p max. 80 mVp-p typ. / 100 mVp-p max.
Start up time (constant resistive load)			30 ms typ. / 60 ms max.
Transient response time (25% load step change)			500 µs max.
Over current limitation			160 % typ. of Iout max. 195 % max. of Iout max.
Short circuit protection			hiccup, automatic recovery
Capacitive load	– Single output	3.3 Vout models: 5.1 Vout models: 12 Vout models: 15 Vout models: 24 Vout models:	2600 µF max. 1300 µF max. 560 µF max. 560 µF max. 200 µF max.
	– Dual output	±12 Vout models: ±15 Vout models:	390 µF max. (each output) 200 µF max. (each output)

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

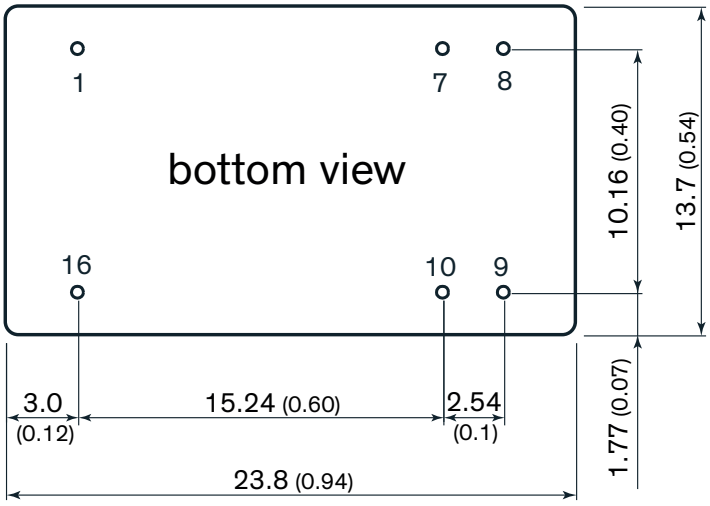
General Specifications

Temperature ranges	– Operating (natural convection: 20 LFM, 0.1 m/s)	
	3.3 & 5.1 Vout models:	–40°C to +80°C
	other output models:	–40°C to +88°C
	– Case temperature	+105°C max.
	– Storage temperature	–55°C to +125°C
Derating	3.3 & 5.1 Vout models:	2.0 %/K above 55°C
	other output models:	2.8 %/K above 70°C
Humidity (non condensing)		95 % rel H max.
Isolation voltage	– Input to output (60 s)	1‘500 VDC
	– Input to output (1 s)	1‘800 VDC
	– Input/output to case	1‘000 VDC
Isolation resistance (input to output, at 500 VDC)		1 GOhm min.
Isolation capacitance (input to output, at 1 VAC / 100 kHz)		1500 pF max.
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		2‘540‘000 h
Switching frequency		355 – 485 kHz. (pulse width modulation)
Safety standards /approvals		IEC/EN/UL 60950-1 IEC/EN/UL 62368-1
Environmental compliance	– Reach	RoHS directive 2011/65/EU
	– RoHS	

Physical Specifications

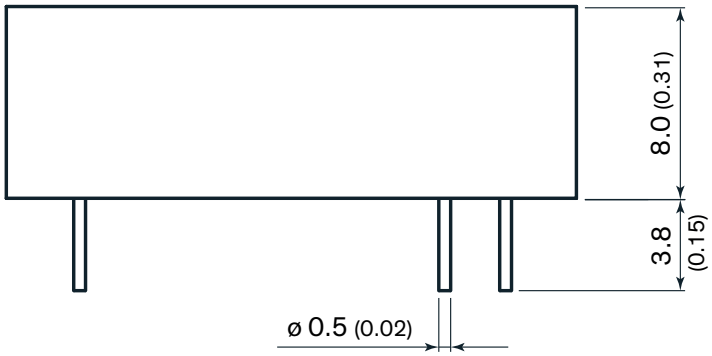
Casing material	Aluminium alloy, black anodized coating
Potting material	Epoxy (UL 94V-0 rated)
Pin material	Tinned copper
Package weight	6.5 g (0.23 oz)
Soldering profile	260°C / 10 s max.

Outline Dimensions



Pin-Out		
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



Dimensions in mm, () = Inch
Tolerances: x.x ±0.5 (±0.02)
x.xx ±0.25 (±0.01)
Pin diameter 0.5 ±0.05 (0.02 ±0.002)