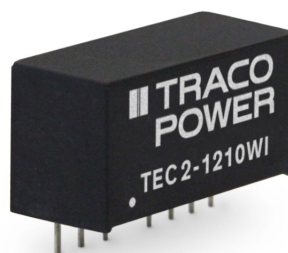


- Compact SIP-8 package
- I/O-isolation voltage 1'600 VDC
- Ultra-wide 4:1 input voltage range
- Fully regulated outputs
- Operating temperature range  
-40°C to +93°C
- Continuous short circuit protection
- Remote On/Off
- 3-year product warranty
- Designed to meet  
UL 62368-1 (UL 60950-1)



TEC 2WI is a new series with the design purpose to improve the prevalent 2 Watt SIP-8 DC/DC converters in terms of cost, efficiency and performance. The latest technology and components enable an increase in efficiency by more than 20%. With the reduction of thermal loss, the operating temperature range can be expanded from -40°C to +93°C. The converters are fully regulated over 0 - 100% load (no minimum load is required). The models are available with ultra-wide input ranges of 4.5-18, 9-36 and 18-75 VDC. The functional I/O-isolation system is designed to meet IEC/EN 62368-1 with a test voltage (60 s) of 1600 VDC.

Models				
Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TEC 2-1210WI	4.5 – 18 VDC (12 VDC nominal)	3.3 VDC	500 mA	75 %
TEC 2-1211WI		5.0 VDC	400 mA	80 %
TEC 2-1219WI		9.0 VDC	222 mA	81 %
TEC 2-1212WI		12 VDC	167 mA	81 %
TEC 2-1213WI		15 VDC	134 mA	82 %
TEC 2-1215WI		24 VDC	83 mA	82 %
TEC 2-1221WI		±5.0 VDC	±200 mA	80 %
TEC 2-1222WI		±12 VDC	±83 mA	82 %
TEC 2-1223WI		±15 VDC	±67 mA	81 %
TEC 2-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	500 mA	76 %
TEC 2-2411WI		5.0 VDC	400 mA	80 %
TEC 2-2419WI		9.0 VDC	222 mA	80 %
TEC 2-2412WI		12 VDC	167 mA	82 %
TEC 2-2413WI		15 VDC	134 mA	82 %
TEC 2-2415WI		24 VDC	83 mA	82 %
TEC 2-2421WI		±5.0 VDC	±200 mA	79 %
TEC 2-2422WI		±12 VDC	±83 mA	82 %
TEC 2-2423WI		±15 VDC	±67 mA	80 %
TEC 2-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	500 mA	74 %
TEC 2-4811WI		5.0 VDC	400 mA	79 %
TEC 2-4819WI		9.0 VDC	222 mA	81 %
TEC 2-4812WI		12 VDC	167 mA	82 %
TEC 2-4813WI		15 VDC	134 mA	81 %
TEC 2-4815WI		24 VDC	83 mA	81 %
TEC 2-4821WI		±5.0 VDC	±200 mA	79 %
TEC 2-4822WI		±12 VDC	±83 mA	81 %
TEC 2-4823WI		±15 VDC	±67 mA	81 %

## Input Specifications

Input current at no load	12 Vin models: 35 mA typ. 24 Vin models: 20 mA typ. 48 Vin models: 10 mA typ.
Surge voltage (1 s 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: 4.5 V (or lower) 24 Vin models: 9 V (or lower) 48 Vin models: 18 V (or lower)
Under voltage shut down	12 Vin models: 2 - 4 V 24 Vin models: 6 - 8 V 48 Vin models: 13 - 17 V
Input filter	internal capacitor
Recommended input fuse	12 Vin models: 1.0 A (slow blow type) 24 Vin models: 0.5 A (slow blow type) 48 Vin models: 0.315 A (slow blow type)
Conducted noise	EN 55032 class A or B with external components
EMC immunity	<ul style="list-style-type: none"> <li>- ESD (electrostatic discharge) EN 61000-4-2, air <math>\pm 8</math> kV, contact <math>\pm 6</math> kV, perf. criteria A</li> <li>- Radiated immunity EN 61000-4-3, 10 V/m, perf. criteria A</li> <li>- Fast transient / surge EN 61000-4-4, <math>\pm 2</math> kV, perf. criteria A</li> <li>(with external input capacitor) EN 61000-4-5, <math>\pm 1</math> kV perf. criteria A</li> <li>all models: Nippon chemi-con KY 220<math>\mu</math>F/100V</li> <li>- Conducted immunity EN 61000-4-6, 10 Vrms, perf. criteria A</li> <li>- Magnetic field immunity EN 61000-4-8</li> <li>100 A/m, continuous, perf. criteria A</li> <li>1000 A/m, 1 sec., perf. criteria A</li> </ul>

## Output Specifications

Voltage set accuracy	$\pm 1$ % max.
Regulation	<ul style="list-style-type: none"> <li>- Input variation (Vin min. to Vin max.) 0.2 % max.</li> <li>- Load variation (0 - 100 %) single output: 1 % max. dual output: 1 % max. (balanced load)</li> <li>- Load variation (10 - 90 %) single output: 0.5 % max. dual output: 0.8 % max. (balanced load)</li> <li>- Cross regulation dual output: 5 % max. (asymmetrical load 25 % / 100 %)</li> </ul>
Temperature coefficient	$\pm 0.02$ %/K max.
Ripple and noise (20 MHz Bandwidth)	75 mVp-p typ.
Start up time	<ul style="list-style-type: none"> <li>- Power ON 10 ms typ. / 20 ms max.</li> <li>(constant resistive load) - Remote ON 10 ms typ. / 20 ms max.</li> </ul>
Transient response time (25% load step change)	500 $\mu$ s typ.
Current limitation	130 - 230 % of Iout max.
Short circuit protection	continuous, automatic recovery
Capacitive load	<ul style="list-style-type: none"> <li>- Single output <ul style="list-style-type: none"> <li>3.3 Vout models: 3300 <math>\mu</math>F max.</li> <li>5.0 Vout models: 1680 <math>\mu</math>F max.</li> <li>9.0 Vout models: 1000 <math>\mu</math>F max.</li> <li>12 Vout models: 820 <math>\mu</math>F max.</li> <li>15 Vout models: 680 <math>\mu</math>F max.</li> <li>24 Vout models: 220 <math>\mu</math>F max.</li> </ul> </li> <li>- Dual output <ul style="list-style-type: none"> <li><math>\pm 5.0</math> Vout models: 1000 <math>\mu</math>F max. (each output)</li> <li><math>\pm 12</math> Vout models: 470 <math>\mu</math>F max. (each output)</li> <li><math>\pm 15</math> Vout models: 330 <math>\mu</math>F max. (each output)</li> </ul> </li> </ul>

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

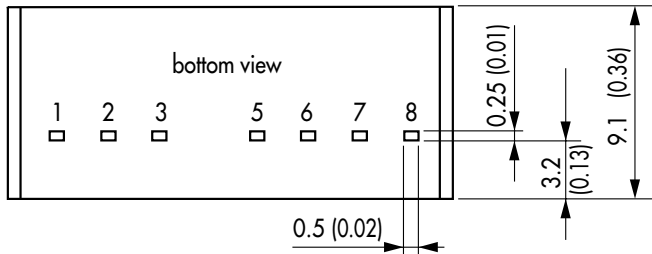
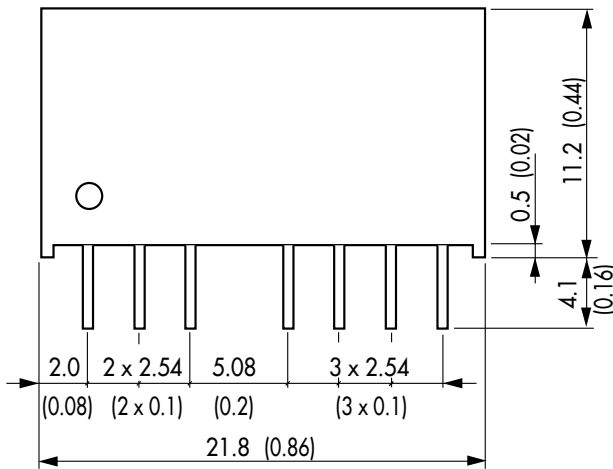
**General Specifications**

Temperature ranges	– Operating (natural convection: 20 LFM, 0.1 m/s) – Case temperature – Storage temperature	–40°C to +93°C +105°C max. –55°C to +125°C
Derating		4.8 %/K above 84°C
Humidity (non condensing)		5 – 95 % rel H max.
Isolation voltage	– I/O isolation voltage (60 s)	1'600 VDC
Isolation resistance (input/output)		1 GOhm min.
Isolation capacitance (input/output)		50 pF max.
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		6'621'000 h
Switching frequency		100 kHz min. (pulse frequency modulation)
Shock, vibration and thermal shock		MIL-STD-810F
Remote On/Off	– On: – Off: – Off idle current:	open circuit or high impedance 2 – 4 mA current applied via 1kOhm resistor 2.5 mA typ.
Safety standards	– Desinged to meet (no certification)	IEC/EN/UL 62368-1, UL 60950-1
Environmental compliance	– Reach – RoHS	RoHS directive 2011/65/EU

**Physical Specifications**

Casing material		non-conducting black plastic
Potting material		Silicone (UL 94V-0 rated)
Pin material		tinned copper
Package weight		4.5 g (0.16 oz)
Soldering profile		260°C / 10 s max. (wave soldering)

**Outline Dimensions**



Pin-Out		
Pin	Single	Dual
1	-Vin (GND)	-Vin (GND)
2	+Vin (VCC)	+Vin (VCC)
3	On/Off	On/Off
5	NC	NC
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

NC: not connected

Dimensions in [mm], () = Inch

Tolerances: x.xx ±0.5 (±0.02)

Pin pitch tolerances ±0.25 (±0.01)

Pin dimension tolerance ±0.1 (±0.004)