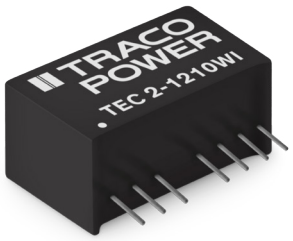
TRACO POWER

DC/DC Converter

TEC 2WI Series, 2 Watt

- **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**
- **Continuos short circuit protection**
- **Remote On/Off**
- **3-year product warranty**



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 approved to IEC/EN 60950-1 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	80 %
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	81 %
TEC 2-4810WI	**18 – 75 VDC** (48 VDC nominal)	3.3 VDC	500 mA	75 %
TEC 2-4811WI		5.0 VDC	400 mA	80 %
TEC 2-4819WI		9.0 VDC	222 mA	81 %
TEC 2-4812WI		12 VDC	167 mA	82 %
TEC 2-4813WI		15 VDC	134 mA	83 %
TEC 2-4815WI		24 VDC	83 mA	82 %
TEC 2-4821WI		±5.0 VDC	±200 mA	80 %
TEC 2-4822WI		±12 VDC	±83 mA	82 %
TEC 2-4823WI		±15 VDC	±67 mA	82 %

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
	– Application note for filter class A/B proposal		www.tracopower.com/overview/tec2wi
EMC immunity	– ESD (electrostatic discharge)		EN 61000-4-2, air ±8 kV, contact ±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
		all models:	Nippon chemi-con KY 220µF/100V
	– Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A
	– Magnetic field immunity		EN 61000-4-8
			100 A/m, continuous, perf. criteria A
			1000 A/m, 1 sec., perf. criteria A

Output Specifications

Voltage set accuracy			±1 % max.
Regulation	– Input variation (Vin min. to Vin max.)		0.2 % max.
	– Load variation (0 – 100 %)	single output:	1 % max.
		dual output:	1 % max. (balanced load)
	– Load variation (10 – 90 %)	single output:	0.5 % max.
		dual output:	0.8 % 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)			75 mVp-p typ.
Start up time	– Power ON		10 ms typ. / 20 ms max.
(constant resistive load)	– Remote ON		10 ms typ. / 20 ms max.
Transient response time (25% load step change)			500 µs typ.
Current limitation			130 - 230 % of Iout max.
Short circuit protection			continuous, automatic recovery
Capacitive load	– Single output	3.3 Vout models:	3300 µF max.
		5.0 Vout models:	1680 µF max.
		9.0 Vout models:	1000 µF max.
		12 Vout models:	820 µF max.
		15 Vout models:	680 µF max.
		24 Vout models:	220 µF max.
	– Dual output	±5.0 Vout models:	1000 µF max. (each output)
		±12 Vout models:	470 µF max. (each output)
		±15 Vout models:	330 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) – 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 /approvals	– Certification documents	IEC/EN/UL 60950-1 www.tracopower.com/overview/tec2wi
Environmental compliance	– Reach – RoHS	www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU

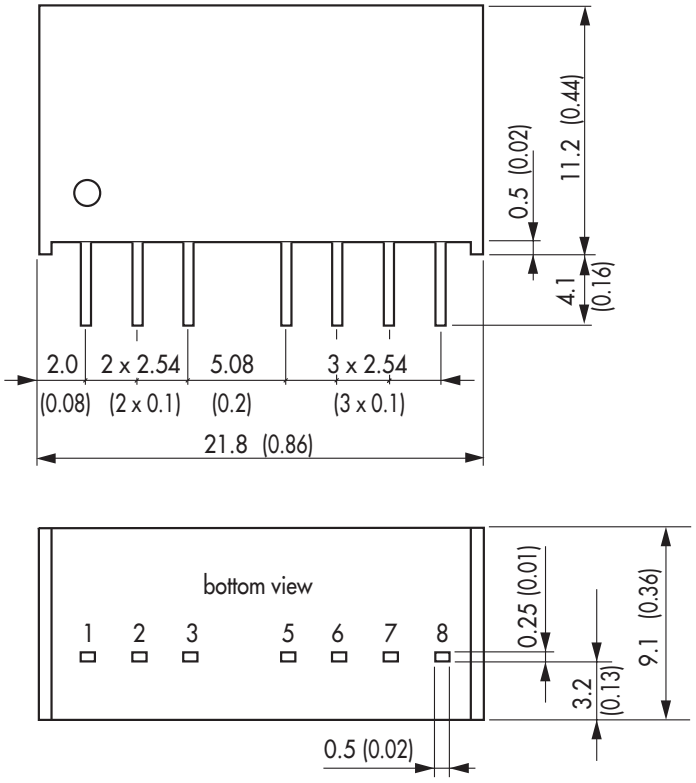
Physical Specifications

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)

Supporting Documents: www.tracopower.com/overview/tec2wi

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

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)