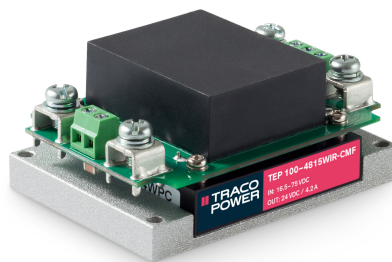


DC/DC Railway Converter

TEP 100WIRCMF Series, 100 Watt

- Chassis mount with screw terminal block
- Ultra wide 4:1 input voltage ranges 9–36, 18–75, 43–160 VDC
- EN 50155 approval for railway applications
- Very high efficiency up to 93%
- No minimum load
- Soft start
- Adjustable output voltage +10/-20%
- Sense line
- Remote On/Off input
- Under voltage lock-out circuit



The TEP 100WIRCMF Series is a family of isolated high performance DC/DC converter modules with ultra-wide 4:1 input voltage ranges. They come in chassis mount version with screw terminal block. A very high efficiency allows full power operation without forced air cooling at 60°C. The very wide input voltage range and reverse input voltage protection make these converters interesting solution for battery operated systems. Typical applications are in telecom/datacom, industry control and railway systems for on board power distribution.

Options	
TEP-MK1	- Optional DIN-Rail Mounting Kit: www.tracopower.com/products/tep-mk1.pdf
on demand (backorder with MOQ non stocking item)	- Optional model with 3.3 VDC / 25'000 mA Output and 9 - 36 VDC Input - Optional model with 5 VDC / 20'000 mA Output and 9 - 36 VDC Input - Optional model with 12 VDC / 8'400 mA Output and 9 - 36 VDC Input - Optional model with 15 VDC / 6'700 mA Output and 9 - 36 VDC Input - Optional model with 24 VDC / 4'200 mA Output and 9 - 36 VDC Input - Optional model with 28 VDC / 3'600 mA Output and 9 - 36 VDC Input - Optional model with 48 VDC / 2'100 mA Output and 9 - 36 VDC Input - Optional model with 3.3 VDC / 25'000 mA Output and 18 - 75 VDC Input - Optional model with 5 VDC / 20'000 mA Output and 18 - 75 VDC Input - Optional model with 12 VDC / 8'400 mA Output and 18 - 75 VDC Input - Optional model with 15 VDC / 6'700 mA Output and 18 - 75 VDC Input - Optional model with 24 VDC / 4'200 mA Output and 18 - 75 VDC Input - Optional model with 28 VDC / 3'600 mA Output and 18 - 75 VDC Input - Optional model with 48 VDC / 2'100 mA Output and 18 - 75 VDC Input - Optional model with 3.3 VDC / 25'000 mA Output and 43 - 160 VDC Input - Optional model with 5 VDC / 20'000 mA Output and 43 - 160 VDC Input - Optional model with 12 VDC / 8'400 mA Output and 43 - 160 VDC Input - Optional model with 15 VDC / 6'700 mA Output and 43 - 160 VDC Input - Optional model with 24 VDC / 4'200 mA Output and 43 - 160 VDC Input - Optional model with 28 VDC / 3'600 mA Output and 43 - 160 VDC Input - Optional model with 48 VDC / 2'100 mA Output and 43 - 160 VDC Input - Inverse Remote On/Off function (passive = off)

Input Specifications

Input Current	- At no load	24 Vin models: 20 mA typ. 48 Vin models: 15 mA typ. 110 Vin models: 10 mA typ.
Surge Voltage		24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.) 110 Vin models: 185 VDC max. (1 s max.)
Under Voltage Lockout		24 Vin models: 7.3 VDC min. / 7.5 VDC typ. / 8.1 VDC max. 48 Vin models: 15.5 VDC min. / 16 VDC typ. / 16.3 VDC max. 110 Vin models: 33 VDC min. / 34.5 VDC typ. / 36 VDC max.
Recommended Input Fuse		24 Vin models: 20'000 mA (fast acting) 48 Vin models: 12'000 mA (fast acting) 110 Vin models: 5'000 mA (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Pi-Type

Output Specifications

Output Voltage Adjustment		-20% to +10% (By external trim resistor) See application note: www.tracopower.com/overview/tep100wircmf Output power must not exceed rated power!
Voltage Set Accuracy		±1% max.
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (0 - 100%)	0.1% max. 0.1% max.
Ripple and Noise (20 MHz Bandwidth)		3.3 Vout models: 75 mVp-p max. (w/ 1 µF X7R // 22 µF poscap) 5 Vout models: 75 mVp-p max. (w/ 1 µF X7R // 22 µF poscap) 12 Vout models: 100 mVp-p max. (w/ 1 µF X7R // 22 µF poscap) 15 Vout models: 100 mVp-p max. (w/ 1 µF X7R // 22 µF poscap) 24 Vout models: 200 mVp-p max. (w/ 4.7 µF X7R) 28 Vout models: 200 mVp-p max. (w/ 4.7 µF X7R) 48 Vout models: 300 mVp-p max. (w/ 2.2 µF X7R)
Capacitive Load		3.3 Vout models: 75'700 µF max. 5 Vout models: 40'000 µF max. 12 Vout models: 7'000 µF max. 15 Vout models: 4'460 µF max. 24 Vout models: 1'750 µF max. 28 Vout models: 1'280 µF max. 48 Vout models: 430 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Start-up Time		75 ms typ.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		150% typ. of Iout max. (110 Vin models) 120 - 150% (other models)
Overvoltage Protection		115 - 130% of Vout nom.
Transient Response	- Response Time	200 µs typ. / 250 µs max. (25% Load Step)

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 60950-1 IEC 60950-1 UL 60950-1
	- Railway Applications	EN 50155
	- Certification Documents	www.tracopower.com/overview/tep100wircmf

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

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55011 class A (internal filter) EN 55032 class A (internal filter)
	- Radiated Emissions	EN 55011 class A (internal filter) EN 55032 class A (internal filter)
EMS Immunity		EN 50155 (Railway Applications) EN 55024 (IT Equipment)
	- 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, ± 2 kV, perf. criteria A
	- Conducted RF Disturbances	Ext. input component: 24 & 48 Vin models: 2 x KY 220 μ F 110 Vin models: 2 x KXJ 150 μ F
	- PF Magnetic Field	Continuous: EN 61000-4-6, 10 Vrms, perf. criteria A 1 s: EN 61000-4-8, 100 A/m, perf. criteria A 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 +75°C
	- Case Temperature	+105°C max.
	- Storage Temperature	-40°C to +105°C
Power Derating	- High Temperature	See application note: www.tracopower.com/overview/tep100wircmf
Over Temperature	- Protection Mode	115°C typ. (Automatic recovery at 105°C typ.)
Protection Switch Off	- Measurement Point	Base-Plate
Cooling System		Natural convection (20 LFM)
Sense Function		10% max. of Vout nom.
Remote Control	- Voltage Controlled Remote	On: 3.0 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current	3 mA typ.
	- Remote Pin Input Current	-0.5 to 1.0 mA (Optional models with inverse logic available)
Altitude During Operation		2'000 m max.
Switching Frequency		300 kHz typ. (PWM) ($\pm 10\%$, 110 Vin models)
		250 kHz typ. (PWM) ($\pm 10\%$, other models)
Insulation System		Reinforced Insulation
Isolation Test Voltage	- Input to Output, 60 s	3'000 VAC (110 Vin models) 2'250 VDC (other models)
	- Input to Case, 60 s	1'500 VAC (110 Vin models) 1'600 VDC (other models)
	- Output to Case, 60 s	1'500 VAC (110 Vin models) 1'600 VDC (other models)
Isolation Resistance	- Input to Output, 500 VDC	1'000 M Ω min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	2'500 pF max.
Reliability	- Calculated MTBF	409'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration	MIL-STD-810F EN 61373
	- Mechanical Shock	MIL-STD-810F EN 61373
	- Thermal Shock	MIL-STD-810F
Housing Material		Alu base-plate w. plastic case (110 Vin models) Alu base-plate w. metal case (other models)
Base Material		Non-conductive FR4 (UL94 V-0 rated) (24 Vin & 48 Vin models only)
Potting Material		Silicone (UL 94 V-0 rated)

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

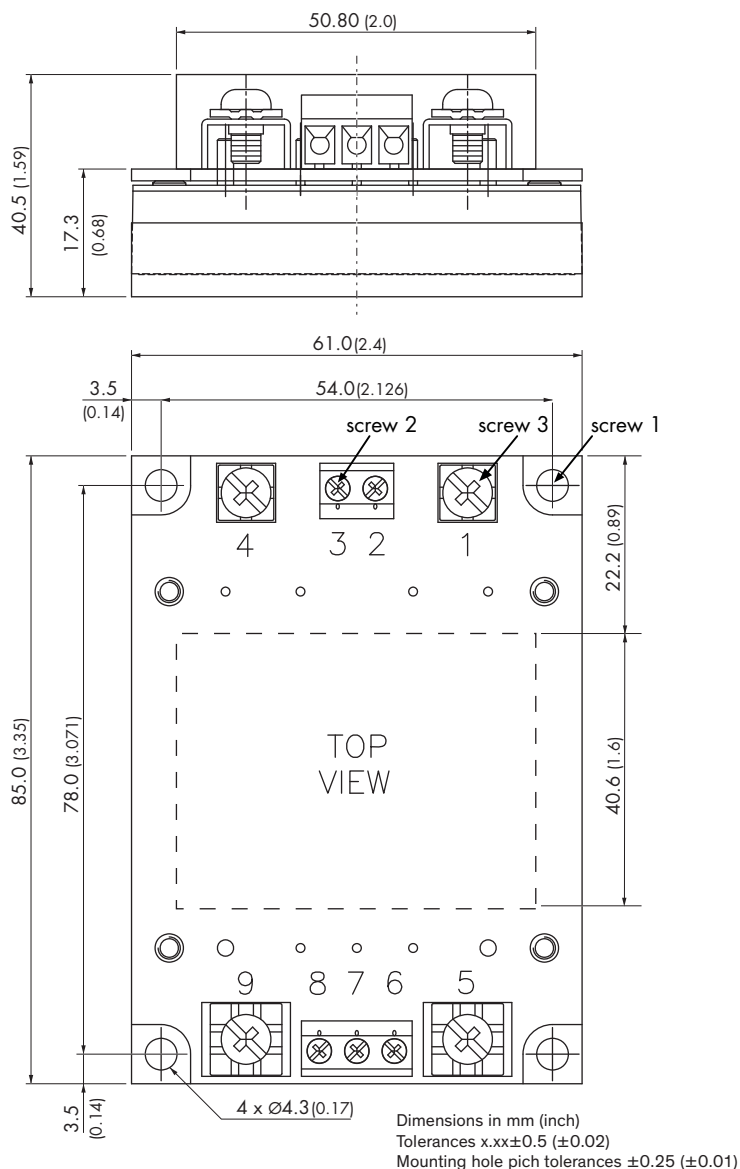
Connection Type	Screw Terminal
Weight	287 g
Thermal Impedance	6.7 K/W
Environmental Compliance	- Reach www.tracopower.com/info/reach-declaration.pdf - RoHS www.tracopower.com/info/rohs-declaration.pdf - Flammability (EN 45545-2) www.tracopower.com/info/en45545-declaration.pdf

Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/tep100wircmf

Outline Dimensions



Pinout	
Pin	Function
1	-Vin (GND)
2	NC
3	Remote
4	+Vin (Vcc)
5	-Vout
6	-Sense
7	Trim
8	+Sense
9	+Vout

NC: No Connection

The screw 1 locked torque:
MAX 11.2kgf-cm/1.14N-m

The screw 2 locked torque:
MAX 5.2kgf-cm/0.51N-m

The screw 3 locked torque:
MAX 12.0kgf-cm/1.18N-m