TRACO POWER

DC/DC Converter — TEP 100CM Series, 100 Watt

- **Chassis mount with screw terminal block**
- **Wide 2:1 input voltage range**
- **Full load operation up to 60°C with convection cooling**
- **Soft start**
- **Under voltage lock-out circuit**
- **Reverse input voltage protection**
- **Input protection filter**
- **Optional DIN-rail mounting kit**
- **3-year product warranty**

UL 60950-1 IEC 60950-1

The TEP-100 Series is a family of isolated high performance DCDC converter modules with ultra-wide 2:1 input voltage ranges. They come in chassis mount version with screw terminal block. These converters are suitable for a wide range of applications, but the product is designed particularly also for industrial applications where often no PCB mounting is possible but the module has to be mounted on a chassis. Four threaded M3 inserts in the module makes chassis mount or attachment of a heatsink for optimal thermal management very simple. For easy connection there is also an unique adaptor available with screw terminals. A very high efficiency allows an operating temperature up to +60°C with natural convection cooling without power derating. Further features include output voltage trim, Remote On/Off and under voltage lockout. The very wide input voltage range and reverse input voltage protection make these converters also an interesting solution for battery operated systems.

Models

Order Code	Input Voltage Range	Output Voltage nom.	Output Current max.	Efficiency typ.
TEP 100-1210-CM	9 - 18 VDC (12 VDC nom.)	3.3 VDC	25'000 mA	90 %
TEP 100-1211-CM		5 VDC	20'000 mA	91 %
TEP 100-1212-CM		12 VDC	8'400 mA	91 %
TEP 100-1213-CM		15 VDC	6'700 mA	91 %
TEP 100-1215-CM		24 VDC	4'200 mA	90 %
TEP 100-1216-CM		28 VDC	3'600 mA	90 %
TEP 100-1218-CM		48 VDC	2'100 mA	90 %
TEP 100-2410-CM	18 - 36 VDC (24 VDC nom.)	3.3 VDC	25'000 mA	91 %
TEP 100-2411-CM		5 VDC	20'000 mA	93 %
TEP 100-2412-CM		12 VDC	8'400 mA	93 %
TEP 100-2413-CM		15 VDC	6'700 mA	93 %
TEP 100-2415-CM		24 VDC	4'200 mA	92 %
TEP 100-2416-CM		28 VDC	3'600 mA	92 %
TEP 100-2418-CM		48 VDC	2'100 mA	92 %
TEP 100-4810-CM	36 - 75 VDC (48 VDC nom.)	3.3 VDC	25'000 mA	91 %
TEP 100-4811-CM		5 VDC	20'000 mA	93 %
TEP 100-4812-CM		12 VDC	8'400 mA	93 %
TEP 100-4813-CM		15 VDC	6'700 mA	93 %
TEP 100-4815-CM		24 VDC	4'200 mA	92 %
TEP 100-4816-CM		28 VDC	3'600 mA	92 %
TEP 100-4818-CM		48 VDC	2'100 mA	92 %

Options

TEP-MK1	- Optional DIN-Rail Mounting Kit: www.tracopower.com/products/tep-mk1.pdf
on demand (backorder with MOQ non stocking item)	- Inverse Remote On/Off function (passive = off)

Input Specifications

Input Current	- At no load	12 Vin models:	130 mA typ.
		24 Vin models:	120 mA typ.
		48 Vin models:	70 mA typ.
	- At full load	12 Vin models:	9'400 mA max.
		24 Vin models:	4'600 mA max.
		48 Vin models:	2'300 mA max.
Surge Voltage		12 Vin models:	36 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:	7.5 VDC typ.
		24 Vin models:	16 VDC typ.
		48 Vin models:	34 VDC typ.
Recommended Input Fuse		12 Vin models:	20'000 mA (fast acting)
		24 Vin models:	10'000 mA (fast acting)
		48 Vin models:	5'000 mA (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Reverse Voltage Protection			Parallel diode (external input fuse required)
Input Filter			Internal Pi-Type

Output Specifications

Output Voltage Adjustment			–20% to +10% (By external trim resistor)
		See application note:	www.tracopower.com/overview/tep100cm
			Output power must not exceed rated power!
Voltage Set Accuracy			±1% max.
Regulation	- Input Variation (Vmin - Vmax)		0.1% max.
	- Load Variation (0 - 100%)		0.1% max.
Ripple and Noise (20 MHz Bandwidth)		3.3 Vout models:	75 mVp-p max. (w/ 4.7 µF X7R)
		5 Vout models:	75 mVp-p max. (w/ 4.7 µF X7R)
		12 Vout models:	100 mVp-p max. (w/ 4.7 µF X7R)
		15 Vout models:	100 mVp-p max. (w/ 4.7 µF X7R)
		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			25 ms typ.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			110 - 140% of Iout max.
Overvoltage Protection			115 - 130% of Vout nom.
Transient Response	- Response Time		200 µs typ. / 250 µs max. (25% Load Step)

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

Safety Specifications

Safety Standards	- IT / Multimedia Equipment		EN 60950-1 IEC 60950-1 UL 60950-1
	- Certification Documents		www.tracopower.com/overview/tep100cm

EMC Specifications

EMI Emissions	- Conducted Emissions		EN 55011 class B (with external filter) EN 55032 class B (with external filter)
	- Radiated Emissions		EN 55011 class B (with external filter) EN 55032 class B (with external filter)
		External filter proposal:	www.tracopower.com/overview/tep100cm
EMS Immunity			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, 10 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
		Ext. input component:	2 x 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 +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/tep100cm
Over Temperature Protection Switch Off	- Protection Mode		115°C typ. (Automatic recovery at 105°C typ.)
	- Measurement Point	See application note:	www.tracopower.com/overview/tep100cm
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			270 - 330 kHz (PWM) 300 kHz typ. (PWM)
Insulation System			Basic Insulation
Isolation Test Voltage	- Input to Output, 60 s		2'250 VDC
	- Input to Case, 60 s		1'600 VDC
Isolation Resistance	- Input to Output, 500 VDC		1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V		2'500 pF max.
Reliability	- Calculated MTBF		331'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration		MIL-STD-810F
	- Thermal Shock		MIL-STD-810F
Housing Material			Metal
Base Material			Non-conductive FR4 (UL94 V-0 rated)
Potting Material			Silicone (UL 94 V-0 rated)
Connection Type			Screw Terminal
Weight			200 g

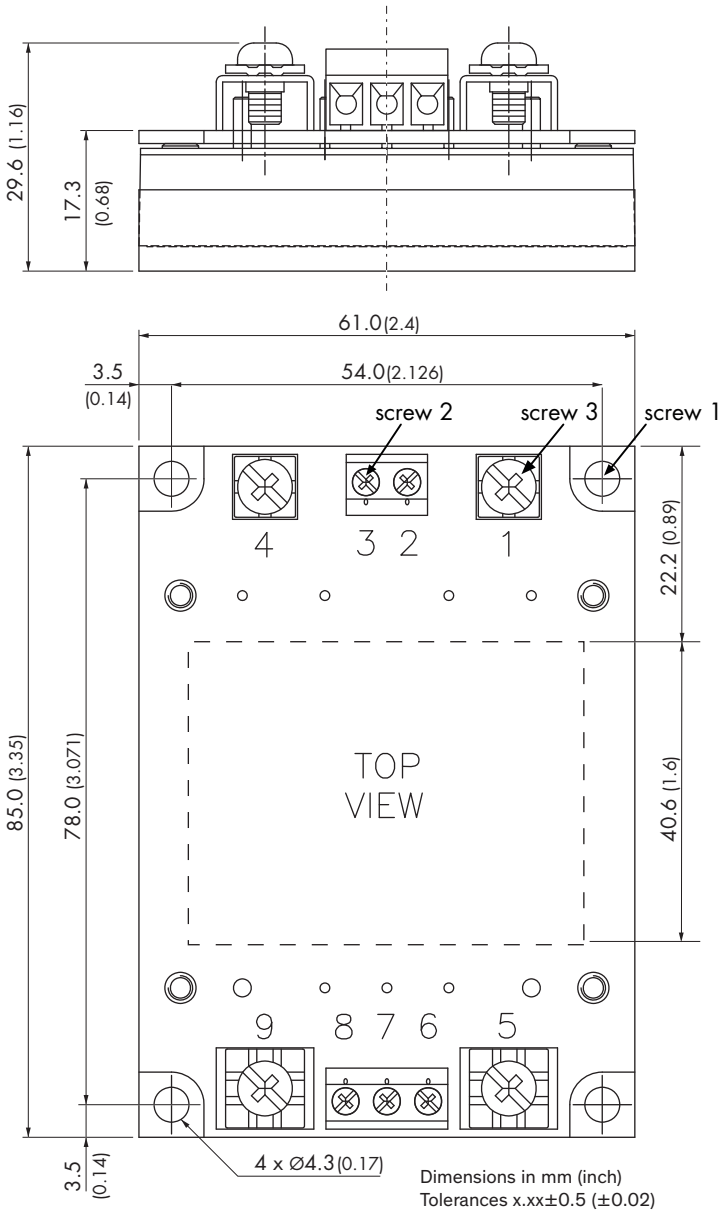
All specifications valid at nominal voltage, full load and +25°C after warm-up time unless otherwise stated.

Thermal Impedance		6.7 K/W
Environmental Compliance	- Reach	www.tracopower.com/info/reach-declaration.pdf
	- RoHS	www.tracopower.com/info/rohs-declaration.pdf

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tep100cm

Outline Dimensions



Dimensions in mm (inch)
Tolerances x.xx±0.5 (±0.02)
Mounting hole pich tolerances ±0.25 (±0.01)

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

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