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**
- **Input protection filter**
- **Optional DIN-rail mounting kit**
- **3-year product warranty**



UL 62368-1 IEC 62368-1

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 make these converters also an interesting solution for battery operated systems.

Models

Order Code	Input Voltage Range	Output Voltage nom. (adjustable)	Output Current max.	Efficiency typ.
TEP 100-1210-CM	9 - 18 VDC (12 VDC nom.)	3.3 VDC (2.64 - 3.63 VDC)	25'000 mA	90 %
TEP 100-1211-CM		5 VDC (4.0 - 5.5 VDC)	20'000 mA	91 %
TEP 100-1212-CM		12 VDC (9.6 - 13.2 VDC)	8'400 mA	91 %
TEP 100-1213-CM		15 VDC (12.0 - 16.5 VDC)	6'700 mA	91 %
TEP 100-1215-CM		24 VDC (19.2 - 26.4 VDC)	4'200 mA	90 %
TEP 100-1216-CM		28 VDC (22.4 - 30.8 VDC)	3'600 mA	90 %
TEP 100-1218-CM		48 VDC (38.4 - 52.8 VDC)	2'100 mA	90 %
TEP 100-2410-CM	18 - 36 VDC (24 VDC nom.)	3.3 VDC (2.64 - 3.63 VDC)	25'000 mA	91 %
TEP 100-2411-CM		5 VDC (4.0 - 5.5 VDC)	20'000 mA	93 %
TEP 100-2412-CM		12 VDC (9.6 - 13.2 VDC)	8'400 mA	93 %
TEP 100-2413-CM		15 VDC (12.0 - 16.5 VDC)	6'700 mA	93 %
TEP 100-2415-CM		24 VDC (19.2 - 26.4 VDC)	4'200 mA	92 %
TEP 100-2416-CM		28 VDC (22.4 - 30.8 VDC)	3'600 mA	92 %
TEP 100-2418-CM		48 VDC (38.4 - 52.8 VDC)	2'100 mA	92 %
TEP 100-4810-CM	36 - 75 VDC (48 VDC nom.)	3.3 VDC (2.64 - 3.63 VDC)	25'000 mA	91 %
TEP 100-4811-CM		5 VDC (4.0 - 5.5 VDC)	20'000 mA	93 %
TEP 100-4812-CM		12 VDC (9.6 - 13.2 VDC)	8'400 mA	93 %
TEP 100-4813-CM		15 VDC (12.0 - 16.5 VDC)	6'700 mA	93 %
TEP 100-4815-CM		24 VDC (19.2 - 26.4 VDC)	4'200 mA	92 %
TEP 100-4816-CM		28 VDC (22.4 - 30.8 VDC)	3'600 mA	92 %
TEP 100-4818-CM		48 VDC (38.4 - 52.8 VDC)	2'100 mA	92 %

Options

TEP-MK1	- Optional DIN-Rail Mounting Kit: www.tracopower.com/overview/tep-mk1
on demand (backorder with MOQ non stocking item)	- Optional models with 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.)
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, resistive full load and +25°C after warm-up time, unless otherwise stated.

Safety Specifications

Standards	- IT / Multimedia Equipment		EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- 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) EN 55035 (Multimedia)
	- 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		Depending on model
		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. (If sense function is not used, sense pins must be connected to corresponding polarity output pins.)
Remote Control	- Voltage Controlled Remote (passive = on)		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 Remote On/Off function (passive = off))
Altitude During Operation			2'000 m max. (for basic insulation) 5'000 m max. (for functional insulation)
Switching Frequency			270 - 330 kHz (PWM) 300 kHz typ. (PWM)
Insulation System			Basic Insulation
Isolation Test Voltage	- Input to Output, 60 s		3'000 VDC
	- Input to Case, 60 s		1'600 VDC
	- Output to Case, 60 s		1'600 VDC
Isolation Resistance	- Input to Output, 500 VDC		1'000 MΩ min.

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

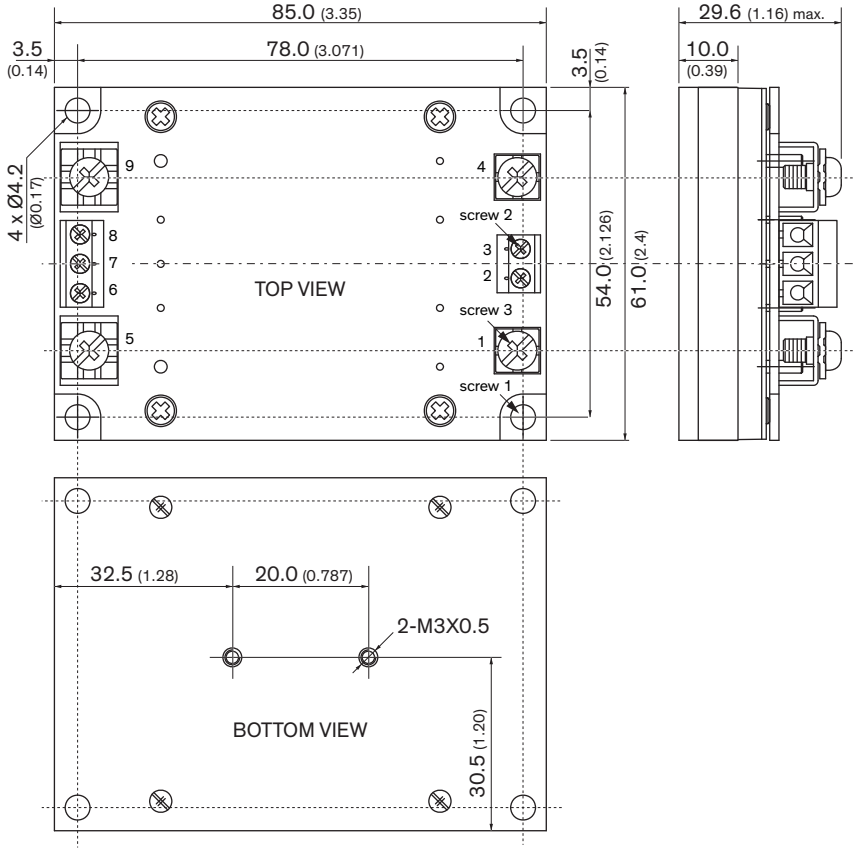
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	2'500 pF max.
Reliability	- Calculated MTBF	331'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration	MIL-STD-810F
	- Thermal Shock	MIL-STD-810F
Housing Material		Metal
Base Material		Non-conductive FR4 (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Housing Type		Metal Case
Mounting Type		Chassis Mount
Connection Type		Screw Terminal
Weight		200 g
Thermal Impedance	- Case to Ambient	6.7 K/W typ.
Environmental Compliance	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	d73382ca-b2d5-4e8b-a2a8-2df10fa7b240

Supporting Documents

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

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

Outline Dimensions



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

The screw 1 locked torque: max. 11.2 kgfcm / 1.1 Nm
The screw 2 locked torque: max. 5.2 kgfcm / 0.51 Nm
The screw 3 locked torque: max. 12.0 kgfcm / 1.18 Nm

Screw 3:
Type M4
Head diameter 6.88 (0.271)
Rated current: 15 A

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

Wire gauge range:
AWG 14 - 26

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