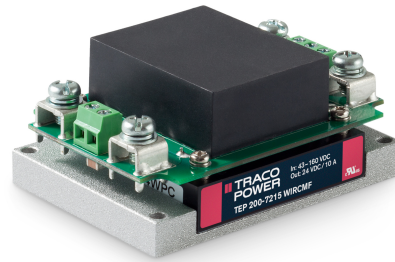




**THE DATASHEET OF
TEP 200-4818WIRCMF**



- Chassis mount with screw terminal block
- Including EMI filter to meet EN 55032, class A
- 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 91%
- No minimum load
- Soft start
- Under voltage lock-out circuit
- Adjustable output voltage +10 / -20%
- Sense line
- 3-year product warranty



The TEP 200WIRCMF 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 and with integrated EMI input filter to meet EN 55032 class A. A very high efficiency allows full power operation at 25°C with only 100 LFM air flow cooling and operation at 60°C with only 40% power derating. The very wide input voltage range makes these converters interesting solution for battery operated systems. Typical applications are in telecom/datacom, industry control and railway systems for onboard power distribution.

Models

| Order Code | Input Voltage Range | Output Voltage nom. (adjustable) | Output Current max. | Efficiency typ. |
|--------------------|--------------------------------|----------------------------------|---------------------|-----------------|
| TEP 200-2412WIRCMF | 9 - 36 VDC (24 VDC nom.) | 12 VDC (9.6 - 13.2 VDC) | 15'000 mA | 89 % |
| TEP 200-2413WIRCMF | | 15 VDC (12.0 - 16.5 VDC) | 12'000 mA | 90 % |
| TEP 200-2415WIRCMF | | 24 VDC (19.2 - 26.4 VDC) | 7'500 mA | 90 % |
| TEP 200-2416WIRCMF | | 28 VDC (22.4 - 30.8 VDC) | 6'500 mA | 90 % |
| TEP 200-2418WIRCMF | | 48 VDC (38.4 - 52.8 VDC) | 3'700 mA | 89 % |
| TEP 200-4812WIRCMF | 18 - 75 VDC (48 VDC nom.) | 12 VDC (9.6 - 13.2 VDC) | 18'000 mA | 90 % |
| TEP 200-4813WIRCMF | | 15 VDC (12.0 - 16.5 VDC) | 14'000 mA | 91 % |
| TEP 200-4815WIRCMF | | 24 VDC (19.2 - 26.4 VDC) | 9'000 mA | 90 % |
| TEP 200-4816WIRCMF | | 28 VDC (22.4 - 30.8 VDC) | 7'500 mA | 91 % |
| TEP 200-4818WIRCMF | | 48 VDC (38.4 - 52.8 VDC) | 4'500 mA | 90 % |
| TEP 200-7212WIRCMF | 43 - 160 VDC (110 VDC nom.) | 12 VDC (9.6 - 13.2 VDC) | 20'000 mA | 89 % |
| TEP 200-7213WIRCMF | | 15 VDC (12.0 - 16.5 VDC) | 16'000 mA | 90 % |
| TEP 200-7215WIRCMF | | 24 VDC (19.2 - 26.4 VDC) | 10'000 mA | 89 % |
| TEP 200-7216WIRCMF | | 28 VDC (22.4 - 30.8 VDC) | 8'500 mA | 90 % |
| TEP 200-7218WIRCMF | | 48 VDC (38.4 - 52.8 VDC) | 5'000 mA | 89 % |

Options

| | |
|--|--|
| TEP-MK1 | - Optional DIN-Rail Mounting Kit: www.tracopower.com/overview/tep-mk1 |
| on demand (backorder with MOQ non stocking item) | <ul style="list-style-type: none"> - Optional model with 3.3 VDC / 50'000 mA Output and 9 - 36 VDC Input - Optional model with 5 VDC / 36'000 mA Output and 9 - 36 VDC Input - Optional model with 3.3 VDC / 50'000 mA Output and 18 - 75 VDC Input - Optional model with 5 VDC / 40'000 mA Output and 18 - 75 VDC Input - Optional model with 53 VDC / 3'800 mA Output and 33 - 75 VDC Input - Optional model with 3.3 VDC / 57'000 mA Output and 43 - 160 VDC Input - Optional model with 5 VDC / 44'000 mA Output and 43 - 160 VDC Input - Optional models with 2:1 Input - Chassis mount models w/o filter: www.tracopower.com/overview/tep200wircmf - Optional models with inverse Remote On/Off function (passive = off) |

Input Specifications

| | | |
|------------------------|--------------|---|
| Input Current | - At no load | 24 Vin models: 35 mA typ. 48 Vin models: 20 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. / 7.7 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: 32'000 mA (fast acting) 48 Vin models: 20'000 mA (fast acting) 110 Vin models: 10'000 mA (fast acting) (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/tep200wircmf 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 25 µF poscap) 5 Vout models: 75 mVp-p max. (w/ 1 µF X7R 25 µF poscap) 12 Vout models: 100 mVp-p max. (w/ 1 µF X7R 25 µF poscap) 15 Vout models: 100 mVp-p max. (w/ 1 µF X7R 25 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) |

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

| | | | |
|---------------------------|-----------------|--|----------------------------------|
| Capacitive Load | - 24 Vin input | 3.3 Vout models: 151'000 µF max. | |
| | | 5 Vout models: 72'000 µF max. | |
| | | 12 Vout models: 12'500 µF max. | |
| | | - 48 Vin input | 15 Vout models: 8'000 µF max. |
| | | | 24 Vout models: 3'100 µF max. |
| | | | 28 Vout models: 2'300 µF max. |
| | | - 110 Vin input | 48 Vout models: 770 µF max. |
| | | | 3.3 Vout models: 151'000 µF max. |
| | | | 5 Vout models: 80'000 µF max. |
| | | 12 Vout models: 15'000 µF max. | |
| | | 15 Vout models: 9'300 µF max. | |
| | | 24 Vout models: 3'700 µF max. | |
| | | 28 Vout models: 2'600 µF max. | |
| | | 48 Vout models: 930 µF max. | |
| Minimum Load | | 3.3 Vout models: 172'000 µF max. | |
| | | 5 Vout models: 88'000 µF max. | |
| | | 12 Vout models: 16'600 µF max. | |
| | | 15 Vout models: 10'600 µF max. | |
| | | 24 Vout models: 4'100 µF max. | |
| | | 28 Vout models: 3'000 µF max. | |
| | | 48 Vout models: 1'000 µF max. | |
| Temperature Coefficient | | Not required | |
| Hold-up Time | | ±0.02 %/K max. | |
| Start-up Time | | 10 ms min. (acc. to EN 50155 Class S2, see application note for ext. capacitor calculation: www.tracopower.com/info/holdup_en50155.pdf) | |
| Short Circuit Protection | | 75 ms typ. | |
| Output Current Limitation | | Continuous, Automatic recovery | |
| Overvoltage Protection | | 120 - 150% of Iout max. | |
| Transient Response | - Response Time | 115 - 130% of Vout nom. | |
| | | 200 µs typ. / 250 µs max. (25% Load Step) | |

Safety Specifications

| | | |
|-----------------------|-----------------------------|--|
| Standards | - IT / Multimedia Equipment | EN 60950-1 |
| | | EN 62368-1 |
| | | IEC 60950-1 |
| | | IEC 62368-1 |
| | | UL 60950-1 |
| | | UL 62368-1 |
| | - Railway Applications | EN 50155 |
| | - Certification Documents | www.tracopower.com/overview/tep200wircmf |
| Pollution Degree | | PD 2 |
| Over Voltage Category | | OVC II |

EMC Specifications

| | | |
|---------------|-----------------------|--------------------------------------|
| EMI Emissions | - Conducted Emissions | EN 50121-3-2 (EMC for Rolling Stock) |
| | | EN 55011 class A (internal filter) |
| | - Radiated Emissions | EN 55032 class A (internal filter) |
| | | EN 55011 class A (internal filter) |
| | | EN 55032 class A (internal filter) |

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

| | | |
|--------------|--|--|
| EMS Immunity | <ul style="list-style-type: none"> - Electrostatic Discharge - RF Electromagnetic Field - EFT (Burst) / Surge - Conducted RF Disturbances - PF Magnetic Field | EN 50121-3-2 (EMC for Rolling Stock) Air: EN 61000-4-2, ± 8 kV, perf. criteria A Contact: EN 61000-4-2, ± 6 kV, perf. criteria A EN 61000-4-3, 20 V/m, perf. criteria A EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 2 kV, perf. criteria A Ext. input component: 24 & 48 Vin models: 2 x KY 220 μ F 110 Vin models: 2 x KXJ 150 μ F EN 61000-4-6, 10 Vrms, perf. criteria A 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 | <ul style="list-style-type: none"> - Operating Temperature - Case Temperature - Storage Temperature | -40°C to +75°C +115°C max. -40°C to +105°C |
| Power Derating | <ul style="list-style-type: none"> - High Temperature | Depending on model See application note: www.tracopower.com/overview/tep200wircmf |
| Over Temperature Protection Switch Off | <ul style="list-style-type: none"> - Protection Mode - Measurement Point | 120°C typ. (Automatic recovery at 105°C typ.) Base-Plate |
| 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 | <ul style="list-style-type: none"> - Voltage Controlled Remote (passive = on) - Off Idle Input Current - Remote Pin Input Current | On: 3.0 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 3 mA typ. -0.5 to 1.0 mA (Optional models with inverse Remote On/Off function (passive = off)) |
| Altitude During Operation | | 2'000 m max. (for reinforced insulation) 5'000 m max. (for functional insulation) |
| Regulator Topology | | Forward Converter |
| Switching Frequency | | 225 - 275 kHz (PWM) 250 kHz typ. (PWM) |
| Insulation System | | Reinforced Insulation |
| Working Voltage (rated) | | 145 VAC (3,3 and 5 Vout models) 185 VAC (48 and 53 Vout models) 172 VAC (other output models) |
| Isolation Test Voltage | <ul style="list-style-type: none"> - Input to Output, 60 s - Input to Case, 60 s - Output to Case, 60 s | 3'000 VAC 1'500 VAC 1'500 VAC |
| 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 | 300'000 h (MIL-HDBK-217F, ground benign) |
| Environment | <ul style="list-style-type: none"> - Vibration - Mechanical Shock - Thermal Shock - Flammability | MIL-STD-810F EN 61373 MIL-STD-810F EN 61373 MIL-STD-810F EN 45545-2 www.tracopower.com/info/en45545-declaration.pdf |

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

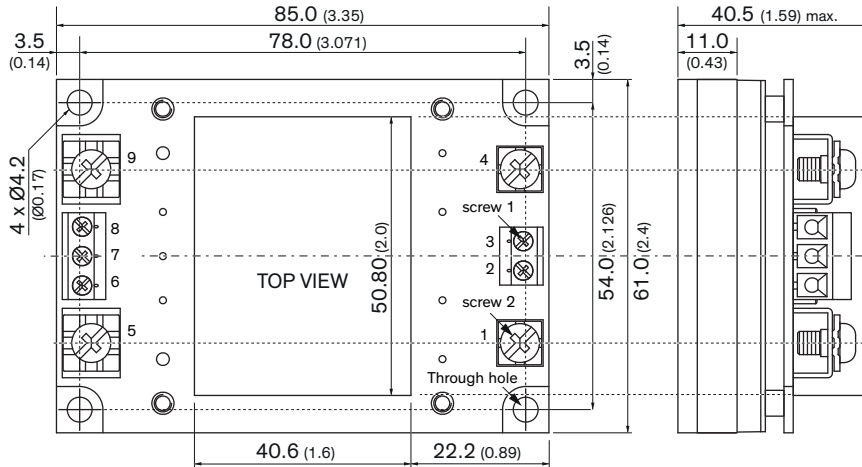
| | |
|--------------------------|---|
| Housing Material | Alu base-plate w. metal case (24 and 48 Vin models) Alu base-plate w. plastic case (110 Vin models) |
| Base Material | Non-conductive FR4 (UL 94 V-0 rated) (24 and 48 Vin models only) |
| Potting Material | Silicone (UL 94 V-0 rated) |
| Housing Type | Metal Case (24 and 48 Vin models) Plastic Case (110 Vin models) |
| Mounting Type | Chassis Mount |
| Connection Type | Screw Terminal |
| Weight | 287 g |
| Thermal Impedance | - Case to Ambient 6.1 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.)) 814f10c5-0fbd-4350-bd50-90d0539e5374 - SCIP Reference Number |

Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/tep200wircmf

Outline Dimensions



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

Screw 2:
Type M5
Head diameter 8.9 (0.350)
Rated current: 65 A

The screw 1 locked torque: max. 5.2 kgfcm / 0.51 Nm
The screw 2 locked torque: max. 16.5 kgfcm / 1.65 Nm

Mounting screw locked torque: max. 11.2 kgfcm / 1.10 Nm



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

Looking for pricing, stock, or lifecycle information?

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