DC/DC Converters

TEP 200WIR Series, 180 – 240 Watt

Features

- Chassis mount with screw terminal block
- Including EMI filter to meet EN 55022, class A
- Ultra wide 4:1 input voltage ranges 8.5–36, 16.5–75, 43–160 VDC
- EN 50155 approval for railway applications
- Very high efficiency up to 91%
- No minimum load
- Soft start
- Ajustable output voltage +10/-20%
- Sense line
- Remote On/Off input
- Reverse input voltage protection
- Over temperature protection
- 3-year product warranty

The TEP 200WIR 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 55022 class A. A very high efficiency allows full power operation at 25°C with only 100 LFM air flow couling and operation at 60°C with only 40% power derating.

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.

Standard Models

Order code	Input voltage	Output voltage	Output current max.	Efficiency typ.
TEP 200–2412WIRCMF	8.5 – 36 VDC (24 VDC nominal)	12 VDC	15 A	89 %
TEP 200–2413WIRCMF		15 VDC	12 A	90 %
TEP 200–2415WIRCMF		24 VDC	7.5 A	90 %
TEP 200–2416WIRCMF		28 VDC	6.5 A	90 %
TEP 200–2418WIRCMF		48 VDC	3.7 A	89 %
TEP 200–4812WIRCMF	16.5 – 75 VDC (48 VDC nominal)	12 VDC	18 A	90 %
TEP 200–4813WIRCMF		15 VDC	14 A	91 %
TEP 200–4815WIRCMF		24 VDC	9 A	90 %
TEP 200–4816WIRCMF		28 VDC	7.5 A	91 %
TEP 200–4818WIRCMF		48 VDC	4.5 A	90 %
TEP 200–7212WIRCMF	43 – 160 VDC (110 VDC nominal)	12 VDC	20 A	89 %
TEP 200–7213WIRCMF		15 VDC	16 A	90 %
TEP 200–7215WIRCMF		24 VDC	10 A	89 %
TEP 200–7216WIRCMF		28 VDC	8.5 A	90 %
TEP 200–7218WIRCMF		48 VDC	5 A	89 %

Options

TEP-MK1	Din-rail mounting kit (incl. mounting screws)
on demand	Models with 3.3 VDC or 5.0 VDC output
	Models with 53 VDC output (input voltage range 33 - 75 VDC)
	Models with 2:1 input voltage ranges: 8.5-22, 16.5-36, 33-75 VDC (only to optimize cost at high volumes)
	Models for PCB mount (EMI Filter not included), optional heatsink and chokes for external filter
	Negative (passive = Off) Remote On/Off function (standard is passive = On)

Input Specifications

Input current at no load (nominal input voltage)	24 V models:	40 mA typ.
	48 V models:	20 mA typ.
	110 V models:	15 mA typ.
Start-up voltage	24 V models:	9.0 VDC max.
	48 V models:	18 VDC max.
	110 V models:	43 VDC max.
Under voltage shut down	24 V models:	7.3 – 8.1 VDC
	48 V models:	15.5 – 16.3 VDC
	110 V models:	33.0 – 36.0 VDC
Surge voltage (1 sec. max.)	24 V models:	50 VDC
	48 V models:	100 VDC
	110 V models:	185 VDC
Conducted noise		EN 55022 class A without external components
ESD (electrostatic discharge)		EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
Radiated immunity		EN 61000-4-3, 20 V/m, perf. criteria A
Fast transient / Surge		EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±2 kV perf. criteria A With external input capacitor:
	24/48V models:	chemi-con KY 200 µF, 100 V, ESR 48 mOhm
	72 V models:	ruby-con BXF 100 µF, 250 V
Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A
Reverse voltage protection		parallel diode
Recommended input fuse (slow blow)	24 V models:	20 A
	48/72 V models:	10 A

Output Specifications

Voltage set accuracy (at full load, nominal input)		±1 %
Output voltage adjustment		+10 % / –20 % by external resistor see application note
Regulation – Input variation Vin min. to Vin max.		0.2 % max.
– Load variation (0 – 100 %)	12 / 15 VDC models:	0.25 % max.
	24 – 48 VDC models:	0.2 % max.
Temperature coefficient		±0.02 %/K
Minimum load		not required
Remote sense		10 % max. of Vout nom. (trim up value to subtract)
Ripple and noise (20 MHz Bandwidth)	12 / 15 VDC models:	100 mVp-p typ.
	24 / 28 VDC models:	200 mVp-p typ.
	48 VDC models:	300 mVp-p typ.
Start up time (nominal Vin and constant resistive load)		75 ms typ. (at power On or remote On/Off)
Transient response (25 % load step change)		250 µs typ.
Output current limitation		at 120 – 150 % of Iout max.
Over voltage protection		at 115 – 130 % of Vout nom.
Short circuit protection		indefinite, automatic recovery.
Capacitive load		t.b.a.

General Specifications

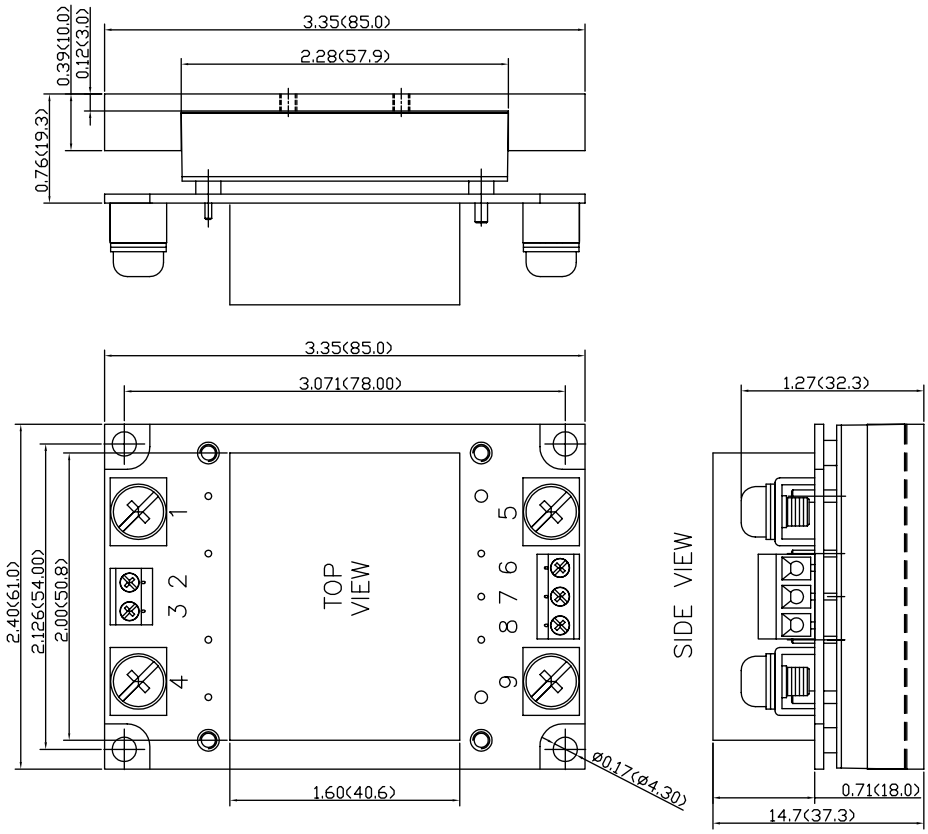
Temperature ranges	– Operating – Case temperature – Storage		–40°C to +75°C +115°C max. –55°C to +125°C
Derating (convection cooling) Guideline values:			depending on installation! approx. 1.2 %/K above +25°C please refer to application note for temperature measure point that should not exceed 115°C.
Over temperature protection			at +120°C
Thermal shock			EN 61373, MIL-STD-810F
Humidity (non condensing)			95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)			75'000 h
Isolation voltage (60sec.)	– Input/Output – Input/Case		2'250 VDC (basic insulation) 1'600 VDC
Isolation capacitance	– Input/Output		2500 pF max.
Isolation resistance	– Input/Output (500 VDC)		>1 GOhm min.
Switching frequency			250 kHz typ. (puls width modulation)
Safety standards			EN 50155, UL 60950-1, IEC/EN 60950-1
Safety approvals	– UL/cUL (entry pending)		www.ul.com -> certifications -> File e188913
Remote On/Off	– positive logic (standard) – negative logic (option) – Off idle current:	– On: – Off: – On: – Off:	3 to 12 VDC or open circuit 0 to 1.2 VDC or short circuit pin 1 and 3 0 to 1.2 VDC or short circuit pin 1 and 3 3 to 12 VDC or open circuit 3 mA
Environmental compliance	– Reach – RoHS		www.tracopower.com/products/tep200wir-reach.pdf RoHS directive 2002/95/EC

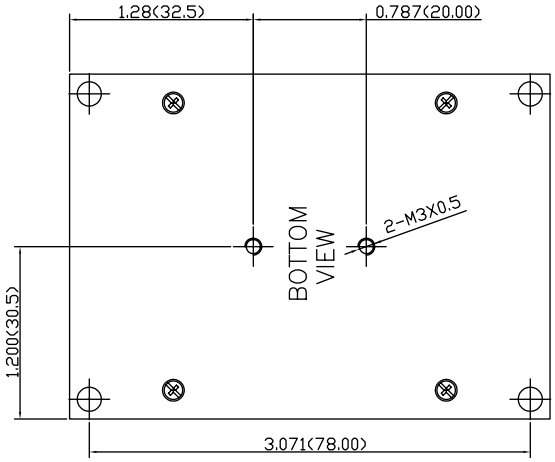
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

General Specifications

Casing material	metal
Potting material	silicon (UL94V-0 rated)
Base material	FR4
Vibration	EN 61373, MIL-STD-810F

Dimensions





Pin-Out

Pin	
1	– Vin
2	Case
3	Remote On/Off
4	+ Vin
5	– Vout
6	– Sense*
7	Trim
8	+ Sense*
9	+ Vout

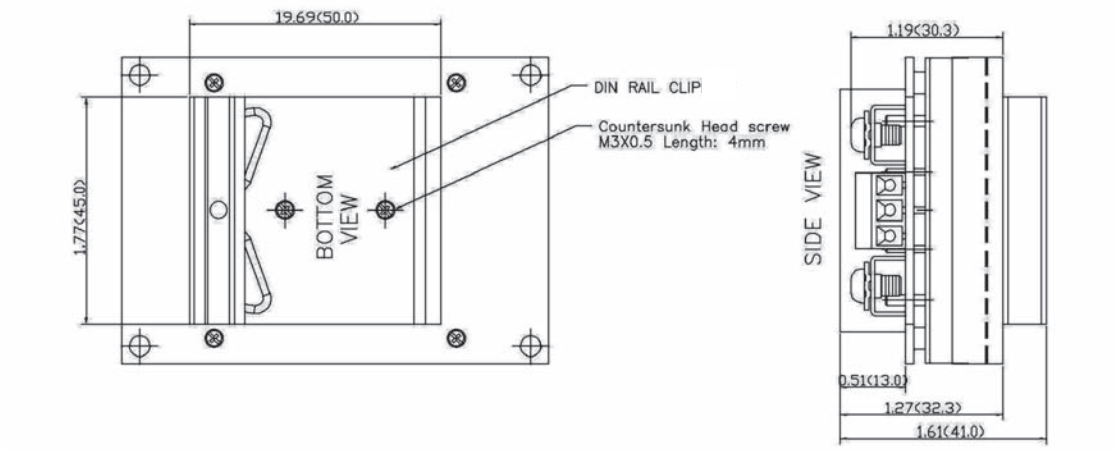
*Sense line to be connected to the output either at the module or at the load under regard of polarity.

Weight: 240g (8.4 oz)

Dimensions in Inch, () = mm
Tolerances ±0.02 (±0.5)
Pin pich tolerances ±0.01 (±0.25)
Mounting hole pich tolerances ±0.01 (±0.25)

Options

TEP-MK1 DIN-rail clip for chassis mount models



Specifications can be changed any time without notice.