



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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Features

- ◆ Shielded metal case with screw terminals
- ◆ 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 89%
- ◆ Constant current output characteristic for battery load applications
- ◆ Optional with input filter to meet EN55032 class B
- ◆ Overtemperature protection
- ◆ Wide Operating temperature range:
–40°C to +75°C
- ◆ Reverse input protection
- ◆ Under voltage lock-out
- ◆ I/O isolation 2250 VDC
- ◆ Easy chassis and wall mounting
- ◆ 3-year product warranty



The modules have originally been designed for harsh industrial environment. High EMC immunity against surge, burst, radiated and conducted disturbances and the shock/ vibration and thermal shock resistance make them very popular for stringent requirements. With the extended input voltage ranges that cover the nominal 24, 36, 72 and 110 VDC with $\pm 40\%$ tolerance and the approval in accordance to EN50155 standard they now also offer a reliable solution for mobile and stationary railway applications. At 100% load the current characteristics goes from constant voltage to constant current what makes the units also suitable for battery charger applications. With protection against over-temperature, overload, short-circuit, reverse input, overvoltage and input under-voltage lock-out they are hard to destroy.

Models

Order code*	Input voltage	Output voltage	Output current max.	Efficiency typ.
TEP 150-2412WI	9 – 36 VDC (24 VDC nominal)	12 VDC	12.5 A	86 %
TEP 150-2413WI		15 VDC	10 A	86 %
TEP 150-2415WI		24 VDC	6.3 A	87 %
TEP 150-2416WI		28 VDC	5.4 A	87 %
TEP 150-2418WI		48 VDC	3.2 A	86 %
TEP 150-4812WI	18 – 75 VDC (48 VDC nominal)	12 VDC	12.5 A	88 %
TEP 150-4813WI		15 VDC	10 A	89 %
TEP 150-4815WI		24 VDC	6.3 A	89 %
TEP 150-4816WI		28 VDC	5.4 A	89 %
TEP 150-4818WI		48 VDC	3.2 A	88 %
TEP 150-7212WI	43 – 160 VDC (110 VDC nominal)	12 VDC	12.5 A	88 %
TEP 150-7213WI		15 VDC	10 A	89 %
TEP 150-7215WI		24 VDC	6.3 A	89 %
TEP 150-7216WI		28 VDC	5.4 A	89 %
TEP 150-7218WI		48 VDC	3.2 A	88 %

Options

suffix –F	Modules with input filter to meet EN 55032 class B, see page 2
on demand	Negative (passive = Off) remote On/Off function (standard is passive = On)range

Input Specifications

Input current (no load)	24 Vin, 12 – 24 VDC models:	80 mA typ.
	24 Vin, 28 – 48 VDC models:	130 mA typ.
	48 Vin, 12 – 24 VDC models:	60 mA typ.
	48 Vin, 28 – 48 VDC models:	70 mA typ.
	110 Vin, 12 – 24 VDC models:	25 mA typ.
	110 Vin, 28 – 48 VDC models:	35 mA typ.
Start-up voltage / under voltage lock-out	24 Vin models:	9 VDC / 8.2 VDC typ.
	48 Vin models:	18 VDC / 16.2 VDC typ.
	110 Vin models:	43 VDC / 34.5 VDC typ.
Surge voltage (1 s max.)	24 Vin models:	50 V
	48 Vin models:	100 V
	110 Vin models:	185 V
Conducted noise (input)		EN 55032 class A, FCC part 15, class A without external components. optional filter for class B – suffix F
EMC immunity		EN 50121-3-2
	– ESD (electrostatic discharge)	EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
	– Radiated immunity	EN 61000-4-3, 10 V/m, perf. criteria A
	– Fast transient / surge	EN 61000-4-4, ±2 kV, perf. criteria A
	(with input capacitor for models without filter module)	EN 61000-4-5, ±1 kV perf. criteria A
	– Input capacitor:	24 Vin models: Nippon chemi-con KY 470 µF, 50 V, ESR 45 mOhm
		48 Vin models: Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm
	110 Vin models: Nippon chemi-con KXJ series, 150 µF, 200V	
	models with filter module (suffix F): no input capacitor required	
– Conducted immunity	EN 61000-4-6, 10 Vrms, perf. criteria A	
– Power frequency magnetic field	EN 61000-4-8, 100 A/m conti., 1000 A/m 1 s	
Reverse voltage protection		parallel diode (input fuse required)
Recommended input fuse (slow blow)	24 Vin models:	30 A
	48 Vin models:	15 A
	110 Vin models:	7 A

Output Specifications

Voltage set accuracy		1 %
Output voltage adjustment		+20 % by external resistor (see application note)
Regulation	– Input variation (Vin min. to Vin max.)	±0.2 % max.
	– Load variation (0 to 100 %)	±0.4 % max.
Temperature coefficient		±0.02 %/K
Minimum load		not required
Ripple and noise (20 MHz Bandwidth)	12 & 15 VDC models:	100 mVpk-pk max.
	24 & 28 VDC models:	200 mVpk-pk max.
	48 VDC models:	350 mVpk-pk max.
Start up time (nominal Vin and constant resistive load)		35 ms typ. (at power On or remote On)
Transient response (25 % load step change)		200 µs typ.
Output current	– Constant voltage (CV)	up to 110 % of Iout max.
	– Constant current (CC)	above 110 % of Iout max.
Over voltage protection		at 125 –140 % of Vout nom.
Short circuit protection		indefinite, automatic recovery
Capacitive load	12 VDC models:	40'000 µF max.
	15 VDC models:	26'000 µF max.
	24 VDC models:	10'000 µF max.
	28 VDC models:	7'600 µF max.
	48 VDC models:	2'600 µF max.

General Specifications

Temperature ranges	<ul style="list-style-type: none"> - Operating - Case temperature - Storage 	-40°C to +75°C +100°C max. -55°C to +125°C
Thermal consideration	<ul style="list-style-type: none"> - Mounting surface - Derating and temperature test point 	Optimize thermal coupling to heat conducting surface. Not to mount on flammable surface! see application note
Over temperature protection		at 110°C (auto restart)
Shock, vibration and thermal shock	<ul style="list-style-type: none"> - Vibration - Shock 	acc. MIL-STD-810F 7.76G / 3 axis / random wavforms / 1h each axis 50G / 3 axis / terminal-peak sawtooth / 11ms
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +70°C, ground benign)		>495'000 h
Isolation voltage (60 s)	<ul style="list-style-type: none"> - Input to Output - Input/Output to Case 	2250 VDC (functional insulation) 1600 VDC
Isolation capacitance	- Input to Output	3500 pF max.
Isolation resistance	- Input to Output (500 VDC)	>1 GOhm min.
Switching frequency		203 – 330 kHz depending on model (puls width modulation)
Safety standards		UL 60950-1, IEC/EN 60950-1
Safety approvals	<ul style="list-style-type: none"> - UL/cUL 60950-1 - CB test certificate - Railway - Certification documents 	www.ul.com -> certifications -> File e188913 IEC 60950-1 EN 50155 www.tracopower.com/overview/tep150wi
Remote On/Off	<ul style="list-style-type: none"> - positive logic (standard) - negative logic (option -N) - Off idle current: 	<ul style="list-style-type: none"> - On: 3 to 12 VDC or open circuit - Off: 0 to 1.2 VDC or short circuit pin 5 and 3 - On: 0 to 1.2 VDC or short circuit pin 5 and 3 - Off: 3 to 12 VDC or open circuit 3 mA
Environmental compliance	<ul style="list-style-type: none"> - Reach - RoHS - Flamability identified acc. EN 45545-2 	www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU www.tracopower.com/info/en45545-declaration.pdf

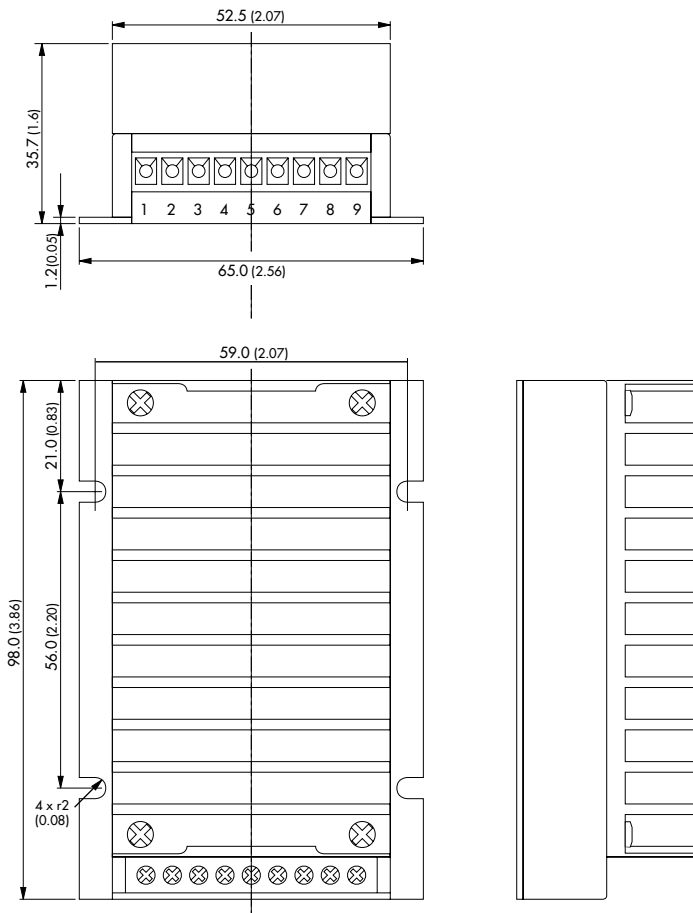
Physical Specifications

Casing material	metal
Potting material	silicone (UL 94V-0 rated)
Case protection	IP 50 (in accordance to IEC/EN 60529)
Weight	300 g (10.6 oz)

Application note: www.tracopower.com/overview/tep150wi

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

Outline Dimensions

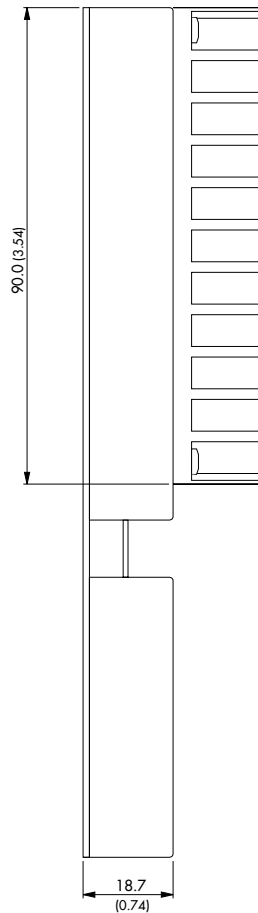
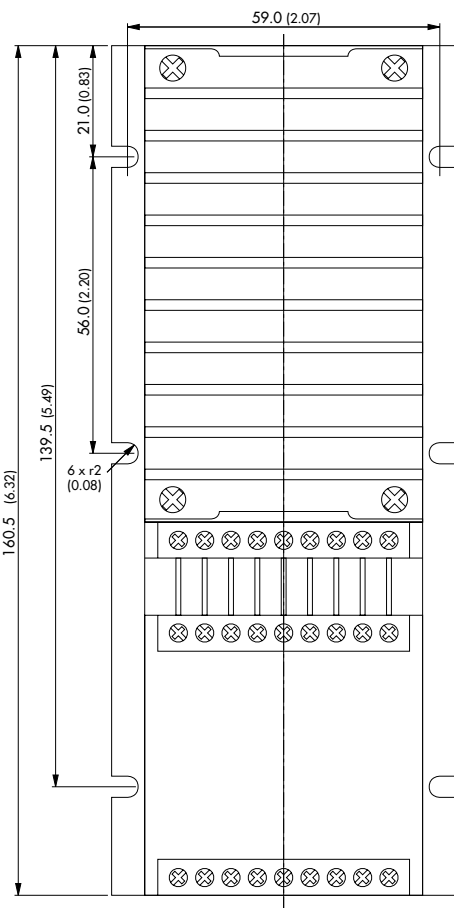
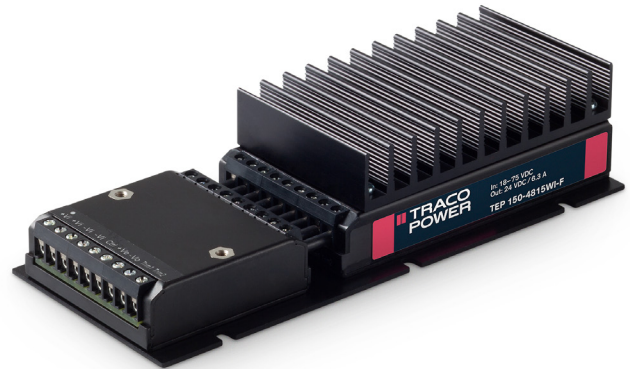
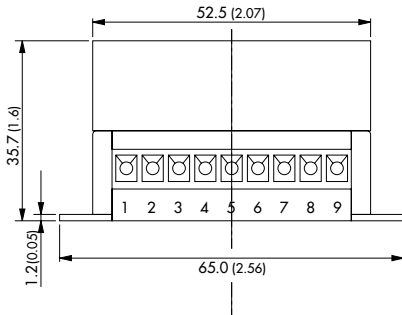


Pin Connection		
pin	function	recommended wire
1	+ Vin	14 - 16 AWG
2	+ Vin	14 - 16 AWG
3	- Vin	14 - 16 AWG
4	- Vin	14 - 16 AWG
5	Remote On/Off	14 - 24 AWG
6	+ Vout	14 - 16 AWG
7	- Vout	14 - 16 AWG
8	Trim	14 - 24 AWG
9	Trim	14 - 24 AWG

Weight: 300 g (10.6oz)

Dimensions in [mm], () = Inch
Mounting slot tolerance: ± 0.25 (± 0.001)
Case tolerances: ± 0.5 (± 0.02)

Outline Dimensions



Pin Connection		
pin	function	recommended wire
1	+ Vin	14 – 16 AWG
2	+ Vin	14 – 16 AWG
3	- Vin	14 – 16 AWG
4	- Vin	14 – 16 AWG
5	Remote On/Off	14 – 24 AWG
6	+ Vout	14 – 16 AWG
7	- Vout	14 – 16 AWG
8	Trim	14 – 24 AWG
9	Trim	14 – 24 AWG

Weight: 435 g (15.3oz)

Dimensions in [mm], () = Inch
Mounting slot tolerance: ± 0.25 (± 0.001)
Case tolerances: ± 0.5 (± 0.02)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com