

Features

- ◆ Shielded metal case with screw terminals
- ◆ Compact dimensions: 98 x 52 x 34 mm
- ◆ Ultra-wide 4:1 input voltage range
- ◆ Very high efficiency up to 87%
- ◆ Constant current output characteristic
- ◆ Operating temp. range -40°C to $+75^{\circ}\text{C}$
- ◆ Reverse input protection
- ◆ I/O isolation 2250 VDC (basic insulation)
- ◆ Easy chassis and wall mounting
- ◆ 3-year product warranty



The TEP-150WI Series is a family of high power density dc-dc converter modules with ultra-wide 4:1 input voltage range which come in an ultra-compact metal case with screw terminal connection. Suitable for a wide range of applications, the TEP-150WI series was particularly designed with industrial applications in mind. The modules have flanges for easy chassis or wall mounting. A very high efficiency allows an operating temperature up to $+50^{\circ}\text{C}$ with natural convection cooling. Further features include adjustable output voltage with constant current characteristic for battery charger applications.

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	85 %
TEP 150-2413WI		15 VDC	10 A	85 %
TEP 150-2415WI		24 VDC	6.3 A	86 %
TEP 150-2416WI		28 VDC	5.4 A	86 %
TEP 150-2418WI		48 VDC	3.2 A	86 %
TEP 150-4812WI	18 – 75 VDC (48 VDC nominal)	12 VDC	12.5 A	86 %
TEP 150-4813WI		15 VDC	10 A	86 %
TEP 150-4815WI		24 VDC	6.3 A	87 %
TEP 150-4816WI		28 VDC	5.4 A	87 %
TEP 150-4818WI		48 VDC	3.2 A	87 %

* – add suffix **-N** for negative remote control, see page 3 -> Remote On/Off

Input Specifications

Input current at no load	24 Vin, 12 – 15 VDC models:	80 mA typ.
	24 Vin, 24 – 48 VDC models:	95 mA typ.
	48 Vin, 12 – 15 VDC models:	60 mA typ.
	48 Vin, 24 – 48 VDC models:	75 mA typ.
Input current at full load	24 Vin models:	7.7 A typ.
	48 Vin models:	3.8 A typ.
Start-up voltage / under voltage shut down	24 Vin models:	8.8 VDC / 8.2 VDC typ.
	48 Vin models:	17.6 VDC / 16.5 VDC typ.
Surge voltage (100 msec. max.)	24 Vin models:	50 V
	48 Vin models:	100 V
Conducted noise (input)	EN 55022 level A, FCC part 15, level 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, 10 V/m, perf. criteria A	
Fast transient / Surge	EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 1 kV perf. criteria A With external input capacitor e.g. Nippon chemi-con KY 200 μ F, 100 V, ESR 48 mOhm or with chassis mount option –CFM	
Conducted immunity	EN 61000-4-3, 10 Vrms, perf. criteria A	
Reverse voltage protection	parallel diode	
Recommended input fuse (slow blow)	24 Vin models:	15 A
	48 Vin models:	10 A

Output Specifications

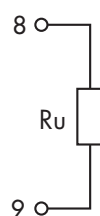
Voltage set accuracy	$\pm 1\%$	
Output voltage adjustment	+20 % by external resistor (see table page 3)	
Regulation	– Input variation Vin min. to Vin max.	0.2 % max.
	– Load variation 0 – 100 %	0.4 % max.
Temperature coefficient	± 0.02 %/K	
Minimum load	not required	
Ripple and noise (20 MHz Bandwidth)	5 VDC models:	75 mVpk-pk max.
	12 & 15 VDC models:	100 mVpk-pk max.
	24 & 28 VDC models:	200 mVpk-pk max.
	48 VDC models:	300 mVpk-pk max.
Start up time (nominal Vin and constant resistive load)	25 ms typ. (at power On or remote On)	
Transient response (25% load step change)	200 μ s typ.	
Output current limitation	at 105 -120 % of Iout max.	
Over voltage protection	at 125 -140 % of Vout nom.	
Short circuit protection	indefinite, automatic recovery	
Capacitive load	t.b.a.	

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

General Specifications

Temperature ranges	- Operating - Case temperature - Storage	-40 °C to +75 °C +95 °C max. -55 °C to +125 °C
Thermal impedance	- without Heatsink - with Heatsink	6.7 °C/W 4.7 °C/W
Derating		2.2 %/K above 50 °C
Over temperature protection		at 110 °C
Thermal shock		acc. MIL-STD-810F
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, 25°C, ground benign)		>180'000 h
Isolation voltage (60sec.)	- Input/Output - Input/Case	2'250 VDC (basic insulation) 1'500 VDC
Isolation capacity	- Input/Output	2500 pF max.
Isolation resistance	- Input/Output (500 VDC)	>1 GOhm min.
Switching frequency		220 – 330 kHz depending on model (puls width modulation)
Safety standards		UL 60950-1, IEC 60950-1, EN 60950-1
Safety approvals (pending)		UL 60950-1, CB- test report
Remote On/Off	- positive logic (standard) - negative logic (option -N) - Off idle current:	- 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

External output trimming:



Ru	12 VDC	15 VDC	24 VDC	28 VDC	48 VDC
+5 %	36	39	39	43	43
+10 %	12	13	13	15	15
+15 %	4.3	5.1	5.6	5.6	5.6
+20 %	0.62	1.1	1.2	1.2	1.2

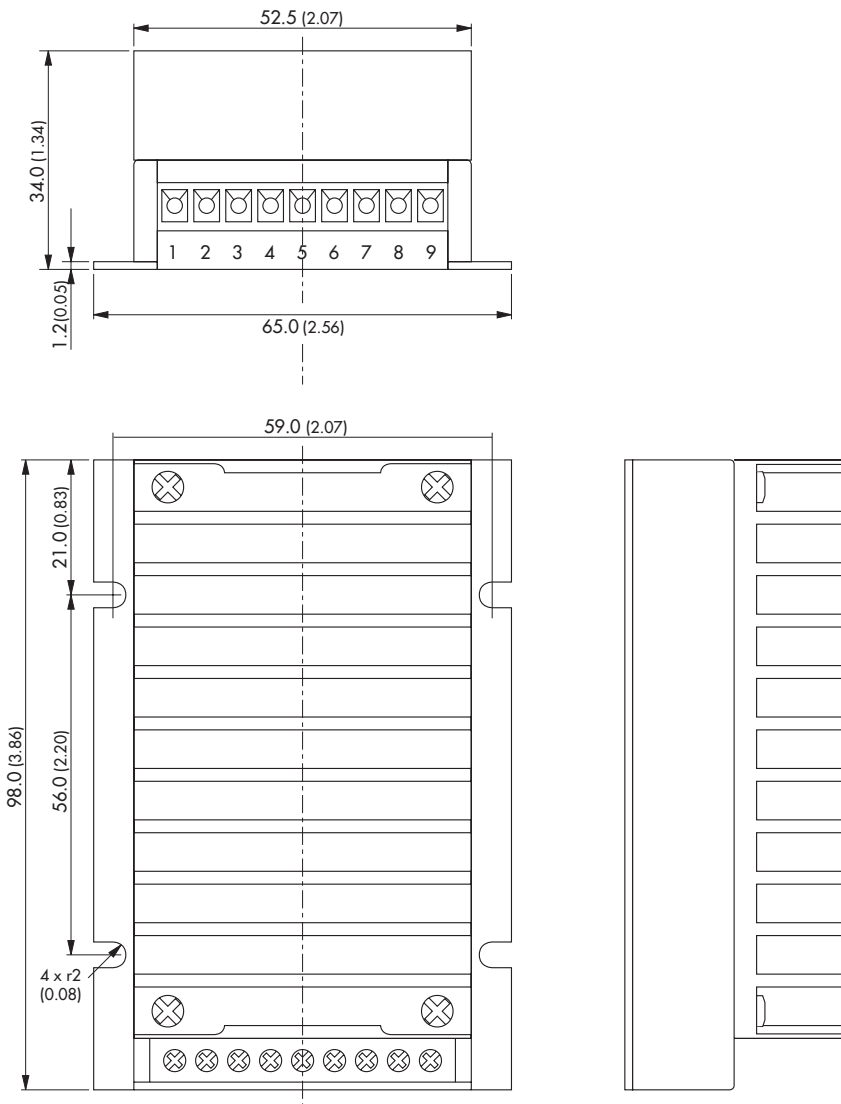
closest resistor out of the E24 array [kOhm]

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

Physical Specifications

Case material	metal
Potting material	silicon (UL 94V-0 rated)
Weight	300 g (10.6 oz)

Outline Dimensions



Pin-Out	
Pin	
1	+ Vin
2	+ Vin
3	- Vin
4	- Vin
5	Remote On/Off
6	+ Vout
7	- Vout
8	Trim
9	Trim

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