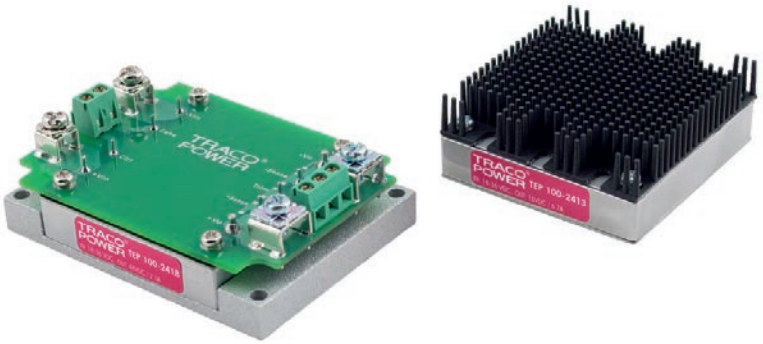
DC/DC Converters

TEP 75WI Series, 75 Watt

cULus pending

Features

- Rugged, compact metal case
- Easy chassis mount
- Screw terminal adaptor available for easy connection
- Ultra wide 4:1 input voltage range
- Full load operation up to 60°C with convection cooling
- Soft start
- Reverse input voltage protection
- Input protection filter
- 3-year product warranty



(Models pictured with chassis mount adaptor and optional heatsink)

The TEP-75WI Series is a family of isolated high performance dc-dc converter modules with ultra-wide 4:1 input voltage ranges which come in a rugged, sealed metal case.

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 trimming, Remote On/Off and under voltage lockout. The very wide input voltage range and reverse input voltage protection make these converters also an interesting solution for battery operated systems.

Models

Order code*	Input voltage	Output voltage	Output current max.	Efficiency typ.
TEP 75-2411WI	**9 – 36 VDC** (24 VDC nominal)	5.0 VDC	15.0 A	88 %
TEP 75-2412WI		12 VDC	6.3 A	88 %
TEP 75-2413WI		15 VDC	5.0 A	88 %
TEP 75-2415WI		24 VDC	3.2 A	87 %
TEP 75-2416WI		28 VDC	2.7 A	87 %
TEP 75-2418WI		48 VDC	1.6 A	87 %
TEP 75-4811WI	**18 – 75 VDC** (48 VDC nominal)	5.0 VDC	15 A	90 %
TEP 75-4812WI		12 VDC	6.3 A	89 %
TEP 75-4813WI		15 VDC	5.0 A	89 %
TEP 75-4815WI		24 VDC	3.2 A	87 %
TEP 75-4816WI		28 VDC	2.7 A	87 %
TEP 75-4818WI		48 VDC	1.6 A	87 %

* – add suffix **–CM**, **–CMF** for models with chassis mount adaptor, see last page.
– add suffix **–N** for negative remote control, see page 3 -> Remote On/Off

Input Specifications

Input current at no load	24 Vin; 5 – 15 VDC models:	185 mA typ.
	24 Vin; 24 – 48 VDC models:	85 mA typ.
	48 Vin; 5 – 15 VDC models:	90 mA typ.
	48 Vin; 24 – 48 VDC models:	50 mA typ.
Input current at full load	24 Vin models:	3600 mA typ. (see Note 1)
	48 Vin models:	1800 mA typ.
Start-up voltage / under voltage shut down	24 Vin models:	8.5 VDC / 7.5 VDC typ.
	48 Vin models:	17.5 VDC / 16 VDC typ.
Surge voltage (100 msec. max.)	24 Vin models:	50 V max.
	48 Vin models:	100 V max.
Conducted noise		EN 55022 level A, FCC part 15, level A (chassis mount option –CFM required)
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 µF, 100 V, ESR 48 mOhm or with chassis mount option –CFM
Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A
Reverse voltage protection		parallel diode
Recommended input fuse (slow blow)	24 Vin models:	10 A
	48 Vin models:	5 A

Output Specifications

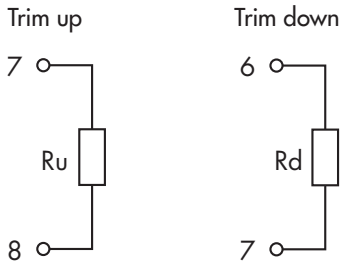
Voltage set accuracy			±1 %
Output voltage adjustment			+10 % / –20 % by external resistor (see table page 3)
Regulation	– Input variation Vin min. to Vin max.		0.2 % max.
	– Load variation (0 – 100 %)	5 – 15 VDC models:	0.3 % max.
		24 – 48 VDC models:	0.3 % max.
Temperature coefficient			±0.02 %/K
Minimum load			not required
Remote sense			10 % max. of Vout nom. (tim up value to subtract)
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 µs typ.
Output current limitation			at 110 -140 % of Iout max.
Over voltage protection			at 115 -130 % of Vout nom.
Short circuit protection			indefinite, automatic recovery
Capacitive load			t.b.a.

Note 1: For operation at low input voltage an input capacitor 4.7µF/50V X7R MLCC or 68µF/100V, 110mOhm Nippon chemi-con KY series is recommended for a reliable supply of the pulse current. Capacitor is already include with chassis mount option –CM and –CFM

General Specifications

Temperature ranges	– Operating – Casing temperature – Storage		–40°C to +75°C +105°C max. –55°C to +125°C
Thermal impedance	– without Heatsink – with Heatsink		6.7 °C/W 4.7 °C/W
Derating			See derating graphs page 4
Over temperature protection			at 115°C
Thermal shock			acc. MIL-STD-810F
Humidity (non condensing)			95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, @ 25°C, ground benign)			75'000 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			300 kHz typ. (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: – 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

External output trimming:



Ru	5 VDC	12 VDC	15 VDC	24 VDC	28 VDC	48 VDC
+ 5 %	62	180	240	390	470	820
+ 10 %	33	91	120	200	240	430

Rd	any output
- 10 %	8.2
- 20 %	3.0

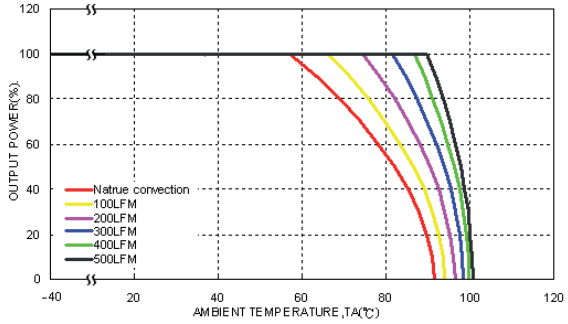
closest resistor out of the E24 array [kOhm]

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

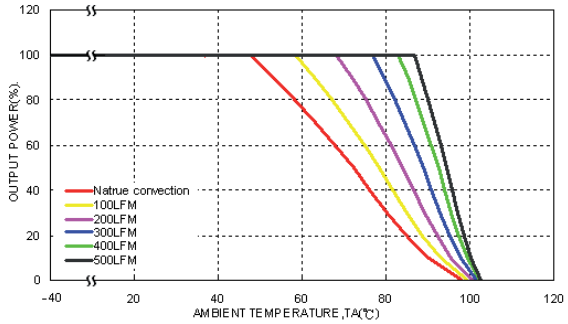
Output Power Derating

Models with heatsink

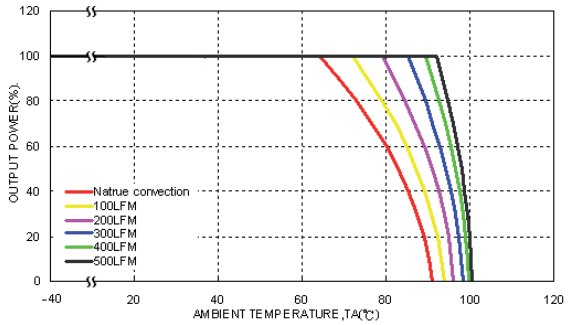
24 Vin models: Output 5–15 VDC



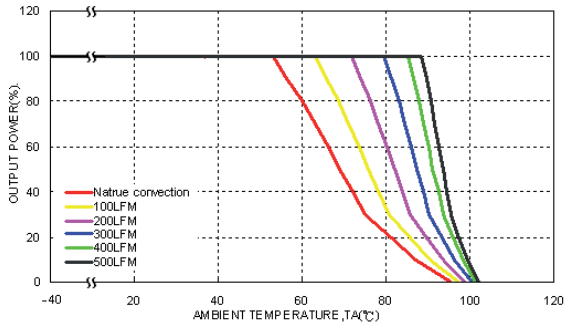
24 Vin models: Output 24–48 VDC



48 Vin models: Output 5–15 VDC

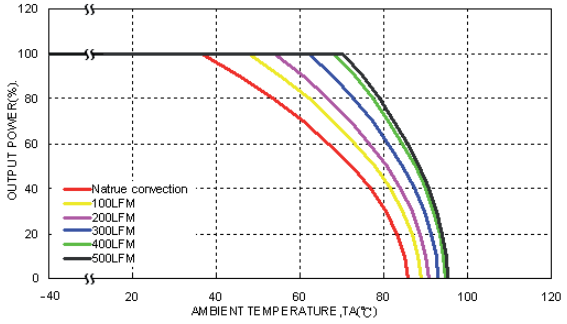


48 Vin models: Output 24–48 VDC

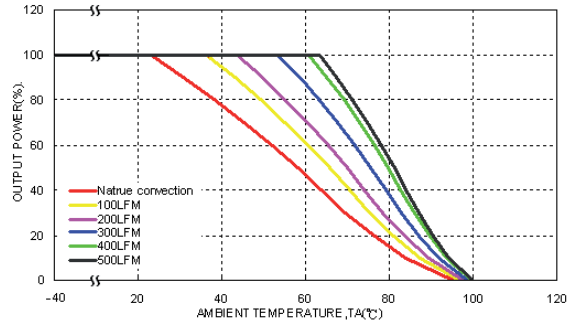


Models without heatsink

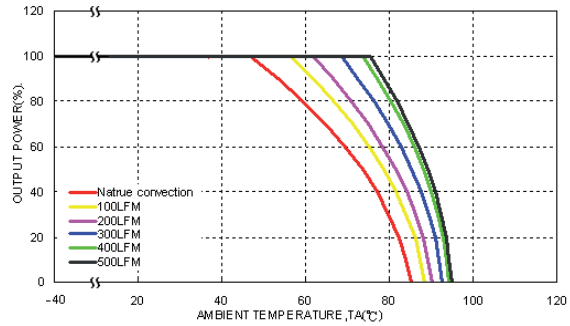
24 Vin models: Output 5–15 VDC



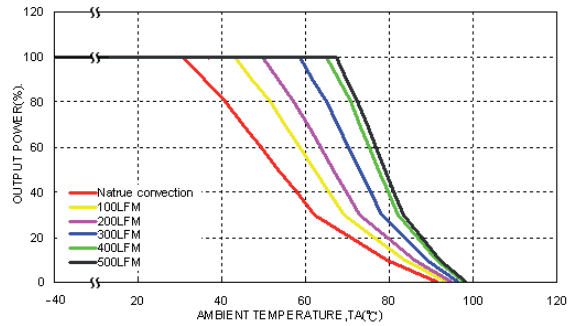
24 Vin models: Output 24–48 VDC



48 Vin models: Output 5–15 VDC



48 Vin models: Output 24–48 VDC

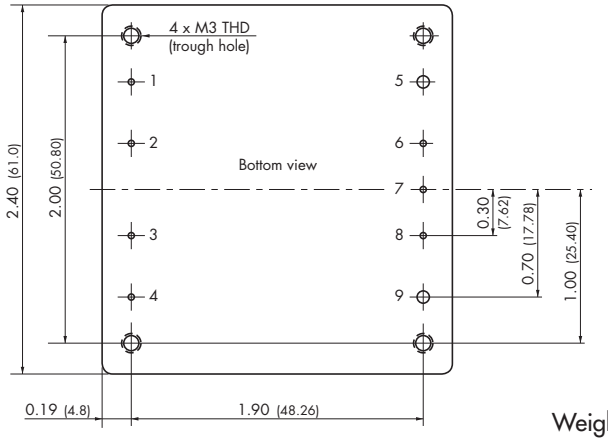


General Specifications

Casing material	metal
Potting material	silicon (UL94V-0 rated)
Base material	FR4
Vibration	acc. MIL-STD-810F

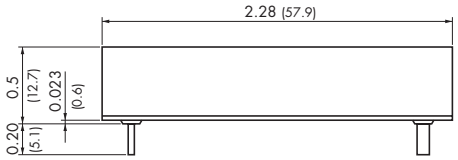
Dimensions

TEP 75 module





Weight: 97g (3.42 oz)

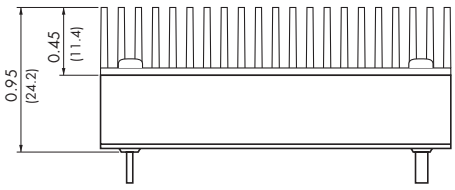


Pin diameter pin 5 & 9: 0.08 (2.0)
Pin diameter other pins: 0.04 (1.0)

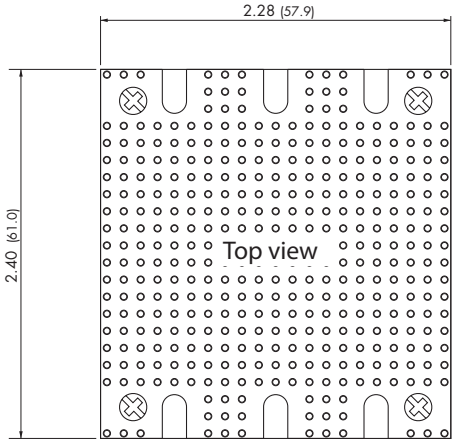
Pin-Out	
Pin	
1	– Vin
2	Case
3	Remote On/Off
4	+ Vin
5	– Vout
6	– Sense*
7	Trim
8	+ Sense*
9	+ Vout

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

TEP-HS1 Heatsink (pictured with heatsink mounted)







Order code: TEP-HS1
Includes heatsink with termal pad and mounting screws
To order modules with mounted heatsink ask factory.

Weight: 135g (4.76 oz)
(Heatsink + Converter)

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

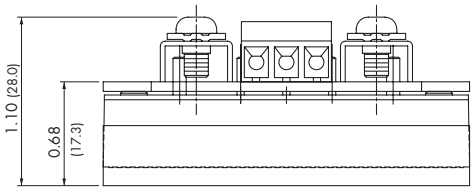
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

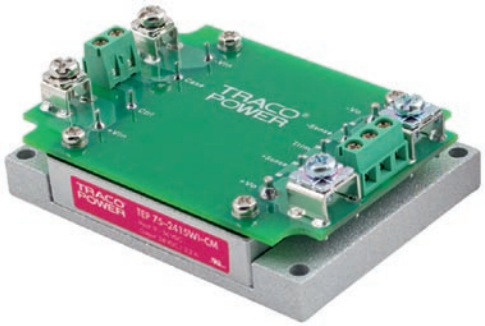
Chassis Mount Adaptor

TEP 75 module with chassis mount adabtor (suffix –CM or –CMF)

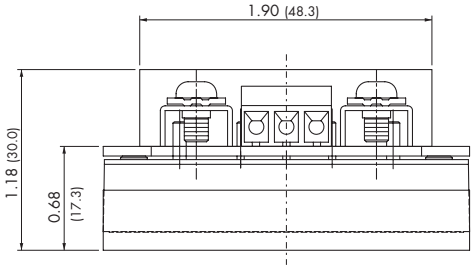
For easy chassis mounting the converter modules can be supplied with an adaptor option consisting of a screw terminal connection board (soldered to converter pins)and a chassis mount adaptor.
In addition this Chassis mount option is available with an EMI-filter(see EMI specification)

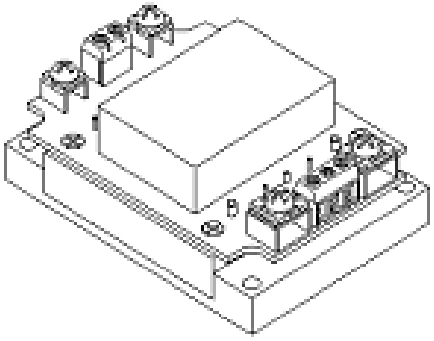
Suffix –CM: Chassis mount adaptor

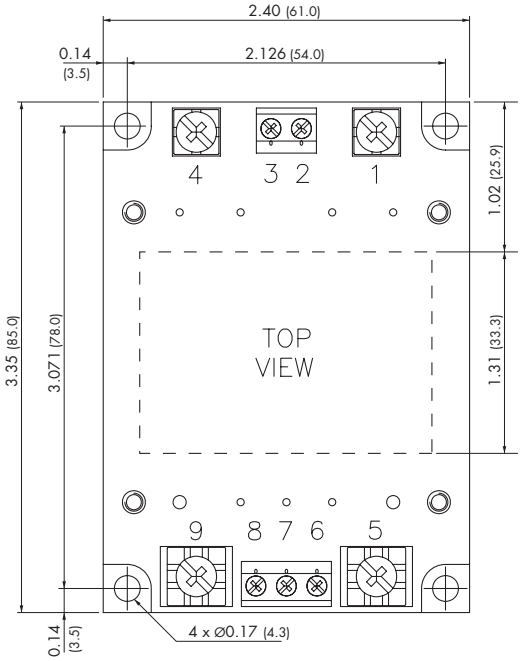




Suffix –CMF: Chassis mount adaptor with EMI filter







Please note that adaptors cannot be ordered as seperate items but are factory assembled.

Connection	
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.

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

Specifications can be changed any time without notice.

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