

DC/DC Converters

TEN 8 Series, 8 Watt



Features

- DIP-24 package with industry standard footprint
- ♦ Wide 2:1 input voltage range
- Input filter meets EN 55022, class A
- Extended operating temperature range: -40°C to +85°C
- Remote On/Off
- Shielded metal casing with insulated baseplate
- ◆ Lead free design, RoHS compliant
- 3-year product warranty



The TEN 8 series is a family of high performance 8 Watt dc/dc-converter modules featuring wide 2:1 input voltage ranges in a DIP-24 package with industry standard footprint. A very high efficiency allows an operating temperature range of -40°C to +85°C. A built-in EMI input filter complies with EN 55022, class A without external components. Further standard features include remote On/Off and short-circuit protection.

Typical applications for these converters are battery operated equipment, instrumentation, communication and industrial electronics, everywhere where isolated, tightly regulated voltages are required and space is limited on the PCB.

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Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.	
TEN 8-1210	9 – 18 VDC (12 VDC nominal)	3.3 VDC	2′000 mA	80 %	
TEN 8-1211		5 VDC	1′500 mA	83 %	
TEN 8-1212		12 VDC	665 mA	88 %	
TEN 8-1213		15 VDC	535 mA	87 %	
TEN 8-1221		±5 VDC	±800 mA	83 %	
TEN 8-1222		±12 VDC	±335 mA	87 %	
TEN 8-1223		±15 VDC	±265 mA	85 %	
TEN 8-2410	18 – 36 VDC (24 VDC nominal)	3.3 VDC	2′000 mA	80 %	
TEN 8-2411		5 VDC	1′500 mA	83 %	
TEN 8-2412		12 VDC	665 mA	86 %	
TEN 8-2413		15 VDC	535 mA	85 %	
TEN 8-2421		±5 VDC	±800 mA	82 %	
TEN 8-2422		±12 VDC	±335 mA	86 %	
TEN 8-2423		±15 VDC	±265 mA	85 %	
TEN 8-4810		3.3 VDC	2′000 mA	80 %	
TEN 8-4811	36 - 75 VDC (48 VDC nominal)	5 VDC	1′500 mA	83 %	
TEN 8-4812		12 VDC	665 mA	86 %	
TEN 8-4813		15 VDC	535 mA	86 %	
TEN 8-4821		±5 VDC	±800 mA	85 %	
TEN 8-4822		±12 VDC	±335 mA	87 %	
TEN 8-4823		±15 VDC	±265 mA	87 %	



Input Specifications			
Input current (no load)		12 Vin models: 24 Vin models: 48 Vin models:	15 mA typ. 15 mA typ. 10 mA typ.
Input current (full load)	12 Vin; 12 Vin; 24 Vin; 24 Vin; 48 Vin; 48 Vin;	3.3 VDC models: other output models: 3.3 VDC models: other output models: 3.3 VDC models: other output models:	720 mA typ. 800 mA typ. 360 mA typ. 400 mA typ. 180 mA typ. 200 mA typ.
Surge voltage (100 msec. r	nax.)	12 Vin models: 24 Vin models: 48 Vin models:	50 V max
Conducted noise (input)			EN 55022 level A, FCC part 15, level A For 12 Vin models with external input capacitor: 4.7 µF / 25 V 1210 MLCC
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 220 µF, 100 V, ESR 48 mOhm
Conducted immunity			EN 61000-4-6, 10 Vrms, perf. criteria A
Output Specification	S		
Voltage set accuracy			±1 %
Regulation	- Input variation Vin mi		0.2 % max.
	– Load variation 0 – 10	single output models:	1 % max. 1 % max. (balanced load) 5 % max. (Load cross variation 25 % / 100 %)
Temperature coefficient			0.02 %/K
Ripple and noise (20 MHz	Bandwidth)		50 mVpk-pk typ.
Start up time (nominal Vin c	ind constant resistive load) – Remote on/off		700 ms max. 5 ms typ.
Transient response (25% loc	ad step change)		200 µs typ.
Short circuit protection			indefinite (automatic recovery)
Over load protection			150 % of lout max. typ. foldback
Capacitive load	F. V	3.3 Vout models: Vout models / ±5 Vout models:	3300 μF max. 1600 μF max. / ±1000 μF max.
	12 V 15 V	out models / ± 12 Vout models: out models / ± 15 Vout models:	350 μF max. / ±160 μF max. 240 μF max. / ±100 μF max.
General Specificatio	12 V 15 V	out models $/ \pm 12$ Vout models:	350 μF max. / ±160 μF max.
General Specification Temperature ranges	12 V 15 V	out models $/ \pm 12$ Vout models:	350 μF max. / ±160 μF max.
	ns - Operating - Casing	out models $/ \pm 12$ Vout models:	$350 \ \mu F \ max. \ / \pm 160 \ \mu F \ max.$ $240 \ \mu F \ max. \ / \pm 100 \ \mu F \ max.$ $-40 \ C \ to +85 \ C \ +100 \ C \ max.$

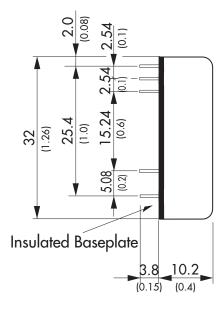
All specifications valid at nominal input voltage, full load and $+25^{\circ}\text{C}$ after warm-up time unless otherwise stated.

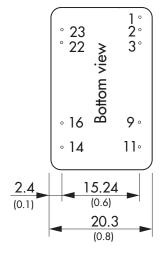


Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)			>3.5 Mio h
Isolation voltage (60sec.)	- Input/Output		1500 VDC
Isolation capacitance	- Input/Output		300 pF max.
Isolation Resistance	- Input/Output		>1000 MOhm
Altitude during operation			4000 m max.
Switching frequency			300 kHz typ. (pulse width modulation PWM)
Thermal shock, mechanical	shock & vibration — Test conditions		EN 61373, MIL-STD-810F www.tracopower.com/products/mil810.pdf
Safety approvals	– Certification documents		UL/cUL 62368-1, IEC/EN 62368-1 UL/cUL 60950-1, IEC/EN 60950-1 www.tracopower.com/overview/ten8
Remote On/Off			3.5 12 VDC or open circuit 0 1.2 VDC or short circuit pin 1 and pin 2/3 2.5 mA
Environmental compliance	- Reach - RoHS		www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU
Physical Specification	ns		
Casing material			copper, nickel plated
Baseplate material			non conductive plastic
Potting material			epoxy (UL94V-0 rated)
Weight			17 g (0.60oz)
Soldering temperature max			265°C / 10 sec.

Outline Dimensions

Supporting documents: www.tracopower.com/overview/ten8





Pin-Out				
Pin	Single	Dual		
1	Remote On/Off	Remote On/Off		
2	-Vin (GND)	-Vin (GND)		
3	-Vin (GND)	-Vin (GND)		
9	No con.	Common		
11	No con.	-Vout		
14	+Vout	+Vout		
16	-Vout	Common		
22	+Vin (Vcc)	+Vin (Vcc)		
23	+Vin (Vcc)	+Vin (Vcc)		

Dimensions in [mm], () = lnch Pin diameter \emptyset 0.5 \pm 0.05 (0.02 \pm 0.002) Tolerances \pm 0.5 (\pm 0.02) Pin pich tolerances \pm 0.25 (\pm 0.01)

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

