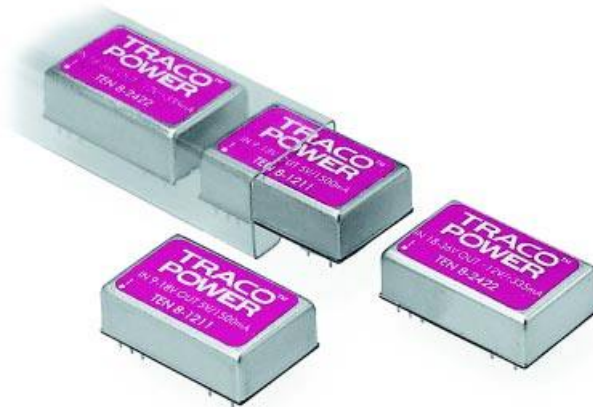


### Features

- Wide 2 : 1 Input Range
- Highest Power Density in a DIP 24
- High Efficiency up to 85%
- Indefinite Short-circuit Protection
- I/O-Isolation 1'500 VDC
- Input Filter meets EN 55022, Class A and FCC, Level A without external Components
- Remote on/off
- Shielded Metal Case with insulated Baseplate
- 24-pin DIP with Industry Standard Pinout
- 2 Year Product Warranty



The TEN 8 series DC/DC converter has been designed for a wide range of space critical applications including tele- and data communication systems and industrial process control systems. The shutdown input feature makes these converters also ideal for mobile battery powered equipment. High efficiency allows operation up to 71°C without derating. Input filtering to EN 55022, class A and low output ripple minimize design-in time and cost.

Models				
Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 8-1210	9 – 18 VDC	3.3 VDC	2'000 mA	80 %
TEN 8-1211		5 VDC	1'500 mA	82 %
TEN 8-1212		12 VDC	665 mA	85 %
TEN 8-1213		15 VDC	535 mA	83 %
TEN 8-1221		± 5 VDC	± 800 mA	83 %
TEN 8-1222		± 12 VDC	± 335 mA	84 %
TEN 8-1223		± 15 VDC	± 265 mA	84 %
TEN 8-2410		18 – 36 VDC	3.3 VDC	2'000 mA
TEN 8-2411	5 VDC		1'500 mA	83 %
TEN 8-2412	12 VDC		665 mA	85 %
TEN 8-2413	15 VDC		535 mA	84 %
TEN 8-2421	± 5 VDC		± 800 mA	82 %
TEN 8-2422	± 12 VDC		± 335 mA	83 %
TEN 8-2423	± 15 VDC		± 265 mA	85 %
TEN 8-4810	36 – 75 VDC		3.3 VDC	2'000 mA
TEN 8-4811		5 VDC	1'500 mA	83 %
TEN 8-4812		12 VDC	665 mA	84 %
TEN 8-4813		15 VDC	535 mA	84 %
TEN 8-4821		± 5 VDC	± 800 mA	82 %
TEN 8-4822		± 12 VDC	± 335 mA	85 %
TEN 8-4823		± 15 VDC	± 265 mA	85 %

### Input Specifications

Input current (no load)	12 Vin models: 24 Vin models: 48 Vin models:	20 mA typ. 15 mA typ. 10 mA typ.
Input current (full load)	12 Vin; 3.3 Vout models: 12 Vin; other output models: 24 Vin; 3.3 Vout models: 24 Vin; other output models: 48 Vin; 3.3 Vout models: 48 Vin; other output models:	700 mA typ. 820 mA typ. 350 mA typ. 400 mA typ. 170 mA typ. 200 mA typ.
Surge voltage (100 msec. max.)	12 Vin models: 24 Vin models: 48 Vin models:	36 V max. 50 V max. 100 V max.
Conducted noise (input)	EN 55022 level A, FCC part 15, level A	

### Output Specifications

Voltage set accuracy	± 2 %	
Regulation	– Input variation Vin min. to Vin max. – Load variation 25 – 100 % – single output models – dual output models balanced load – dual output models unbalanced load	0.2 % max. 0.2 % max. 1.0 % max. 3.0 % max.
Ripple and noise (20 MHz Bandwidth)	50 mVpk-pk max	
Temperature coefficient	± 0.02 % / °C	
Current limitation	> 110% of Iout max., foldback	
Short circuit protection	indefinite (automatic recovery)	
Capacitive load	3.3 Vout models: 5 Vout models / ± 5 Vout models: 12 Vout models / ± 12 Vout models: 15 Vout models / ± 15 Vout models:	3300 µF max. 1600 µF max. / ± 1000 µF max. 350 µF max. / ± 160 µF max. 240 µF max. / ± 100 µF max.

### General Specifications

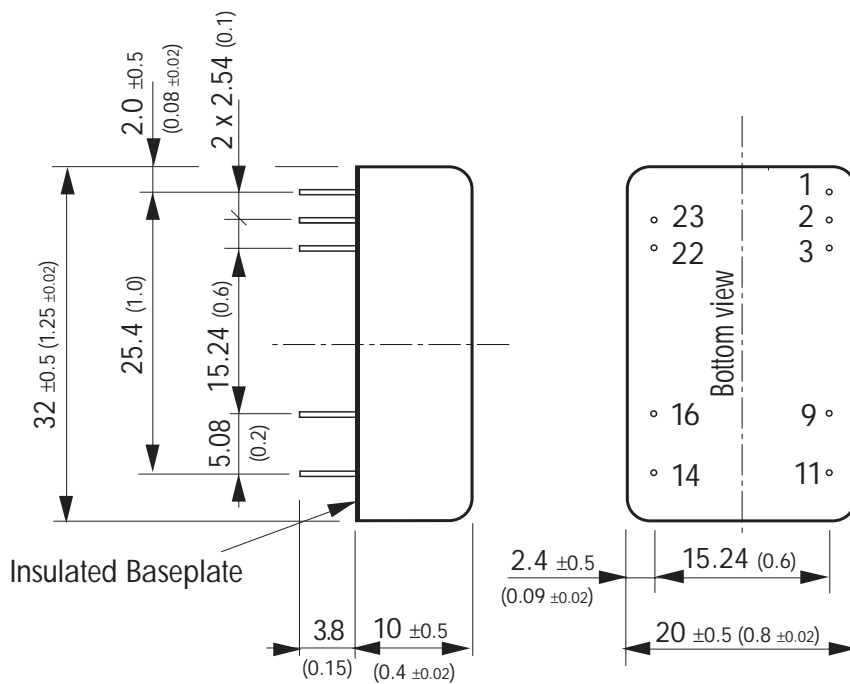
Temperature ranges	– Operating – Case temperature – Storage	– 40 °C ... + 71 °C (no derating) + 100 °C max. – 55 °C ... + 105 °C
Humidity (non condensing)	95 % rel H max.	
Reliability, calculated MTBF (MIL-HDBK-217 E)	> 715'000 h @ + 25 °C	
Isolation voltage	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	300 pF max.
Isolation resistance	– Input/Output (500 VDC)	> 1000 M Ohm
Switching frequency	300 kHz typ. (Pulse width modulation PWM)	
Safety standards	UL /cUL 60950, IEC/EN 60950 compliance up to 60 VDC input voltage (SELV limit)	
Safety approvals	UL /cUL File E188913	
Remote on/off	– ON: – OFF: – OFF idle current:	3.5 ... 12 VDC or open circuit. 0 ... 1.2 VDC or short circuit pin 1 and pin 2/3 2.5 mA

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

**Physical Specifications**

Case material	Copper nickel plated
Baseplate	plastic
Potting material	Epoxy (UL 94V-0 rated)
Weight	17 g (0.60 oz)
Soldering temperature	max. 250 °C / 10 sec.

**Outline Dimensions mm (inches)**



Pin-Out		
Pin	Single	Dual
1	Remote on/off	Remote on/off
2	-Vin (GND)	-Vin (GND)
3	-Vin (GND)	-Vin (GND)
9	No function	Common
11	No function	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02 ±0.002)  
Tolerances  $\pm 0.5$  (0.02)

Specifications can be changed without notice