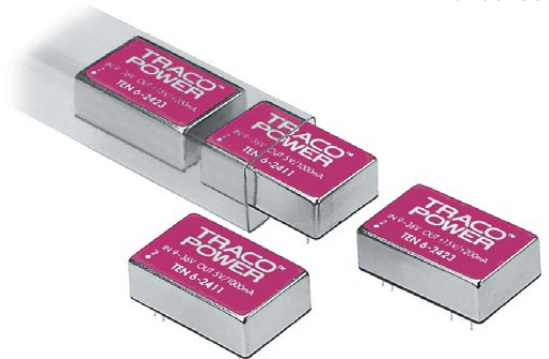


### Features

- ◆ Ultra wide 4:1 Input Range
- ◆ Full SMD-Design
- ◆ High Efficiency up to 84%
- ◆ Extended Operating Temperature Range  
-40°C to +85°C
- ◆ Indefinite Short-circuit Protection
- ◆ Reverse Voltage Protection
- ◆ I/O-isolation 1'500 VDC
- ◆ Input Filter meets EN 55022, Class A and  
FCC, Level A without external Components
- ◆ Shielded Metal Case with insulated  
Baseplate
- ◆ 24-pin DIP with Industry Standard Pinout
- ◆ 3 Year Product Warranty



The TEN 6 series DC/DC converter is designed for applications requiring very wide operating voltage range. Typical applications are tele- and data communication systems, mobile battery powered equipment and industrial process control systems operation from different input voltages i.e. 12/24 VDC or 24/48 VDC battery voltages. High efficiency allows operating temperatures up to 85°C. Input filtering to EN 55022, class A and low output ripple minimise design-in time and cost.

### Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 6-2410	9 – 36 VDC	3.3 VDC	1200 mA	78 %
TEN 6-2411		5 VDC	1000 mA	81 %
TEN 6-2412		12 VDC	500 mA	84 %
TEN 6-2413		15 VDC	400 mA	84 %
TEN 6-2421		± 5 VDC	± 500 mA	81 %
TEN 6-2422		± 12 VDC	± 250 mA	84 %
TEN 6-2423		± 15 VDC	± 200 mA	84 %
TEN 6-4810	18 – 75 VDC	3.3 VDC	1200 mA	78 %
TEN 6-4811		5 VDC	1000 mA	81 %
TEN 6-4812		12 VDC	500 mA	84 %
TEN 6-4813		15 VDC	400 mA	84 %
TEN 6-4821		± 5 VDC	± 500 mA	81 %
TEN 6-4822		± 12 VDC	± 250 mA	84 %
TEN 6-4823		± 15 VDC	± 200 mA	84 %

### Input Specifications

Input current no load /full load	24 Vin models	22 mA / 600 mA typ. (at 12 VDC Vin) 20 mA / 300 mA typ. (at 24 VDC Vin)
	48 Vin models	11 mA / 300 mA typ. (at 24 VDC Vin) 10 mA / 150 mA typ. (at 48 VDC Vin)
Start-up voltage / under voltage shut down	24 Vin models	8.5 VDC / 8.0 VDC typ.
	48 Vin models	17 VDC / 16 VDC typ.
Surge voltage (1 sec. max.)	24 Vin models	50 V max.
	48 Vin models	100 V max.
Reverse voltage protection		1.0 A max.
Conducted noise (input)		EN 55022 level A, FCC part 15, level A

### Output Specifications

Voltage set accuracy		± 1 %
Regulation	– Input variation Vin min. to Vin max.	± 0.3 % max.
	– Load variation 10 – 100 %	
	– single output models	± 1.0 % max.
	– dual output models balanced load	± 1.0 % max.
	– dual output models unbalanced load	± 3.0 % max.
Ripple and noise (20 MHz Bandwidth)		75 mVpk-pk max
Temperature coefficient		± 0.02 % / K
Current limitation		> 110% of I <sub>out</sub> max., constant current
Short circuit protection		indefinite (automatic recovery)
Capacitive load	– single output models	3'000 µF max.
	– dual output models	680 µF max.

### General Specifications

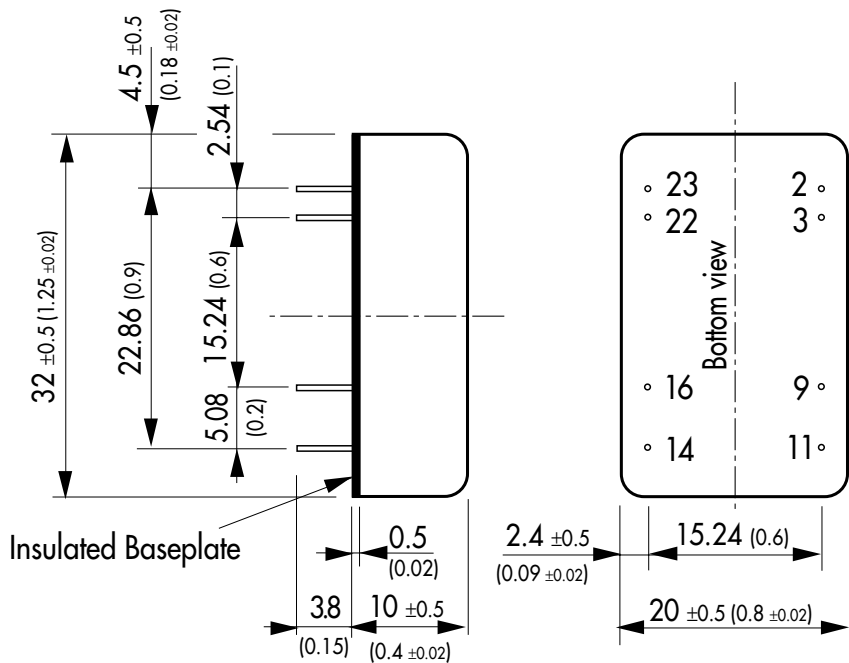
Temperature ranges	– Operating	– 40 °C ... + 85 °C
	– Case temperature	+ 100 °C max.
	– Storage	– 55 °C ... + 125 °C
Derating		3.5% /K above 70°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		>1 Mio. h @ + 25 °C
Isolation voltage	Input/Output	1'500 VDC
Isolation capacity	Input/Output	380 pF typ
Isolation resistance	Input/Output (500 VDC)	> 1'000 M Ohm
Switching frequency		300 kHz typ. (Pulse frequency modulation PFM)
Safety standards		UL/cUL 60950 , IEC 60950, EN 60950 Compliance up to 60 VDC input voltage (SELV limit)
Safety approval		CSA (File no. 226037)

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

**Physical Specifications**

Case material	Steel, Nickel plated
Baseplate material	non conductive FR4
Potting material	Silicon TSE 3331 (UL 94V-0 rated)
Weight	14 g (0.49 oz)
Soldering temperature	max. 260 °C / 10 sec.

**Outline Dimensions mm (inches)**



Pin-Out		
Pin	Single	Dual
2	-Vin (GND)	-Vin (GND)
3	-Vin (GND)	-Vin (GND)
9	No pin	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