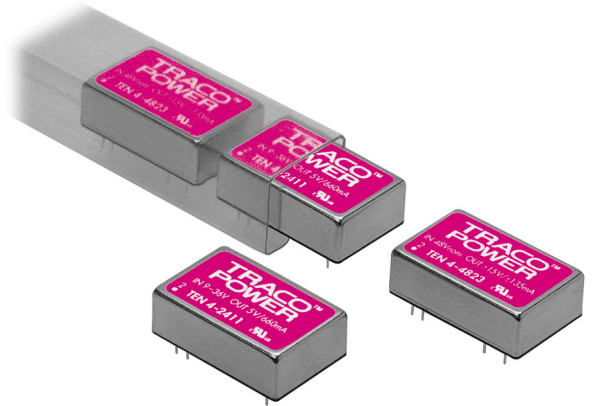


Features

- ◆ Ultra-wide 4:1 input range
9 – 36 VDC or 18 – 75 VDC
- ◆ Full SMD design
- ◆ High efficiency up to 85 %
- ◆ 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
- ◆ MTTF >1 Mio. h
- ◆ 3-year product warranty

not recommended for new design in



The TEN 4 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 equipments and industrial process control systems with operation from different input voltages i.e. 12/24 VDC or 24/48 VDC battery voltages. High efficiency allows operation up to +75°C at full load. Input filtering according to EN 55022-A and FCC, level A. Low output ripple minimize design-in time and cost.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 4-2410	9 – 36 VDC (24 VDC nominal)	3.3 VDC	900 mA	77 %
TEN 4-2411		5 VDC	660 mA	81 %
TEN 4-2412		12 VDC	330 mA	83 %
TEN 4-2413		15 VDC	265 mA	83 %
TEN 4-2421		±5 VDC	±300 mA	80 %
TEN 4-2422		±12 VDC	±165 mA	83 %
TEN 4-2423		±15 VDC	±130 mA	83 %
TEN 4-4810	18 – 75 VDC (48 VDC nominal)	3.3 VDC	900 mA	78 %
TEN 4-4811		5 VDC	660 mA	82 %
TEN 4-4812		12 VDC	330 mA	85 %
TEN 4-4813		15 VDC	265 mA	85 %
TEN 4-4821		±5 VDC	±300 mA	82 %
TEN 4-4822		±12 VDC	±165 mA	85 %
TEN 4-4823		±15 VDC	±130 mA	85 %

Input Specifications

Input current no load / full load	24 Vin models	20 mA typ. / 400 mA typ. (at 12 VDC Vin) 20 mA typ. / 200 mA typ. (at 24 VDC Vin)
	48 Vin models	6 mA typ. / 200 mA typ. (at 24 VDC Vin) 6 mA typ. / 100 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		±1.0 %
Regulation	– Input variation Vin min. to Vin max.	0.3 % max.
	– Load variation 10 – 100 %	
	single output models	1.0 % max.
	dual output models	1.0 % max. balanced load 3.0 % max. unbalanced load
Ripple and noise (20 MHz Bandwidth)		50 mVpk-pk max.
Temperature coefficient		±0.02 %/K
Current limitation		>110 % of Iout max., constant current
Short circuit protection		Hiccup mode, indefinite (automatic recovery)
Capacitive load	– Single output models	3000 µF max.
	– Dual output models	680 µF max.

General Specifications

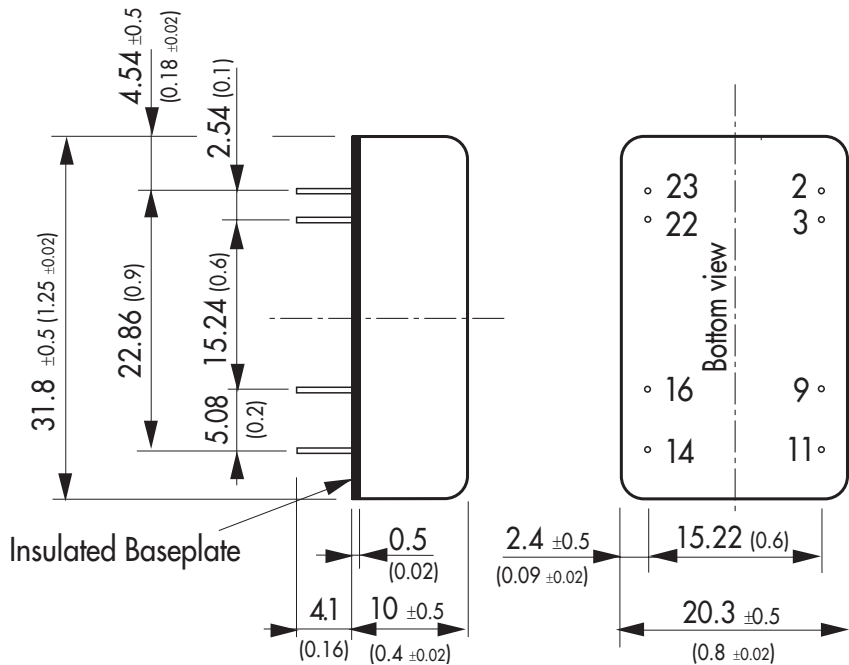
Temperature ranges	– Operating	–40°C to +75°C
	– Casing temperature	+95°C max.
	– Storage	–40°C to +125°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTTF (MIL-HDBK-217F @ +25°C, ground benign)		>1 Mio. h
Isolation voltage (60 sec.)	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	380 pF typ.
Isolation resistance	– Input/Output (500 VDC)	>1'000 M Ohm
Switching frequency		350 kHz typ. (Pulse frequency modulation PFM)
Safety standards		UL 1950 , IEC/EN 60950 Compliance up to 60 VDC input voltage (SELV limit)
Safety approvals	– UL/cUL	www.ul.com > UL File no.: E188913

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

Physical Specifications

Casing material	Steel chrome-nickel plated
Baseplate material	Epoxy
Potting material	Silicon rubber TSE (UL 94V-0 rated)
Weight	16.2 g (0.57 oz)
Soldering temperature	max. 265°C / 10 sec.

Outline Dimensions



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)

Dimensions in [mm], () = Inch
 Pin diameter \varnothing 0.5 \pm 0.05 (0.02 \pm 0.002)
 Tolerances \pm 0.5 (\pm 0.02)
 Pin pitch tolerances \pm 0.35 (\pm 0.014)

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