

#### Features

- Wide 2 : 1 Input Range
- Highest Power Density
- Operating Temp. Range  
- 25°C to +71°C
- Indefinite Short-Circuit Protection
- I/O-Isolation 1500 VDC
- Input Filter meets EN 55022, Class A and FCC, Level A without external Components
- Industry Standard Pinout
- Shielded Metal Case with insulated Baseplate
- 2 Year Product Warranty



The TEN 15 series of DC/DC converters, comprising 21 different models, has been designed for a wide range of applications including communications, industrial systems and battery powered equipments. Full SMD-design with use of ceramic chip capacitors guarantees a high reliability and a long lifetime. Other features of this converters are internal filter to meet EN 55022, class A and FCC, level A and a high efficiency.

Models				
Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 15-1210	9 – 18 VDC	3,3 VDC	4'000 mA	79 %
TEN 15-1211		5 VDC	3'000 mA	82 %
TEN 15-1212		12 VDC	1'250 mA	83 %
TEN 15-1213		15 VDC	1'000 mA	83 %
TEN 15-1221		± 5 VDC	± 1'500 mA	82 %
TEN 15-1222		± 12 VDC	± 625 mA	85 %
TEN 15-1223		± 15 VDC	± 500 mA	85 %
TEN 15-2410	18 – 36 VDC	3,3VDC	4'000 mA	80 %
TEN 15-2411		5 VDC	3'000 mA	83 %
TEN 15-2412		12 VDC	1'250 mA	84 %
TEN 15-2413		15 VDC	1'000 mA	84 %
TEN 15-2421		± 5 VDC	± 1'500 mA	83 %
TEN 15-2422		± 12 VDC	± 625 mA	86 %
TEN 15-2423		± 15 VDC	± 500 mA	86 %
TEN 15-4810	36 – 75 VDC	3,3VDC	4'000 mA	80 %
TEN 15-4811		5 VDC	3'000 mA	83 %
TEN 15-4812		12 VDC	1'250 mA	84 %
TEN 15-4813		15 VDC	1'000 mA	84 %
TEN 15-4821		± 5 VDC	± 1'500 mA	83 %
TEN 15-4822		± 12 VDC	± 625 mA	86 %
TEN 15-4823		± 15 VDC	± 500 mA	86 %

**Input Specifications**

Input current no load /full load	12 Vin models: 24 Vin models: 48 Vin models:	40 mA typ. 25 mA typ. 20 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:	1580 mA typ. 1500 mA typ. 780 mA typ. 740 mA typ. 390 mA typ. 370 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		± 1 %
Regulation	– Input variation Vin min. to Vin max. – Load variation 10 – 100 % – single output models – dual output models balanced load – dual output models unbalanced load	± 1 % max.  ± 0.5 % max. ± 1 % max. ± 3 % max.
Ripple and noise (20 MHz Bandwidth)	single output models: dual output models:	50 mVpk-pk max. 75 mVpk-pk max
Temperature coefficient		± 0.02 % / °C
Output 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:	10'200 µF max. 7'050 µF max. / ± 1'020 µF max. 1'035 µF max. / ± 495 µF max. 750 µF max. / ± 165 µF max.

**General Specifications**

Temperature ranges	– Operating – Case temperature – Storage	– 25 °C ... + 71 °C + 100 °C max. – 55 °C ... + 125 °C
Derating	3.3 VDC output models: other output models:	2.5%/°C above 60°C no derating
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		> 560'000 h @ + 25 °C
Isolation voltage	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	680 pF typ
Isolation resistance	– Input/Output (500 VDC)	> 1'000 MOhm
Switching frequency (fixed)	single output models: dual output models:	500 kHz typ. (Pulse width modulation PWM) 300 kHz typ. (Pulse width modulation PWM)

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

**General Specifications**

Safety standards UL 1950, EN 60950, IEC 60950 (Compliance up to 60 VDC input voltage(SELV limit))

Safety approvals UL /cUL pending

**Physical Specifications**

Case material Copper nickel plated

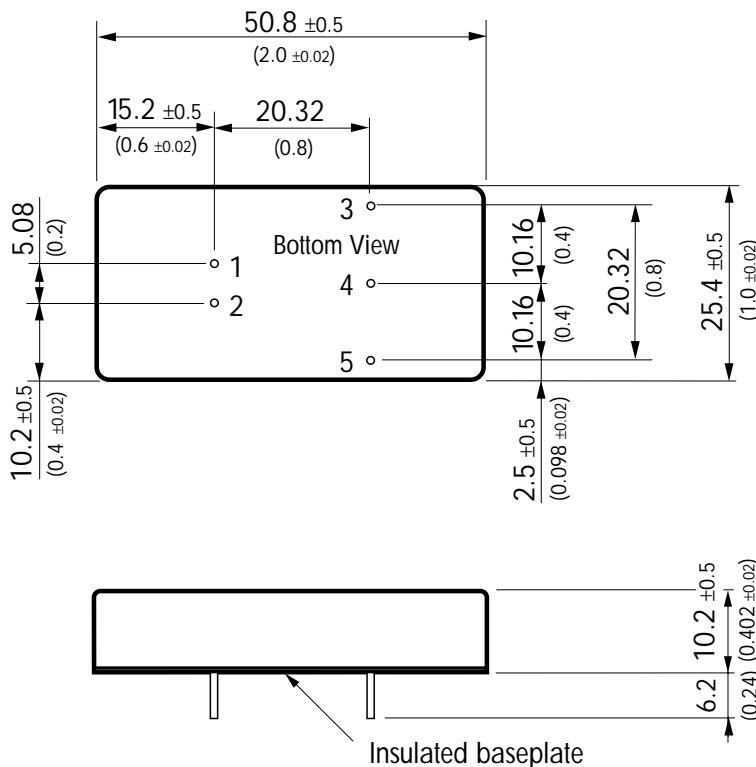
Baseplate Non conductive plastic

Potting material Epoxy (flammability to UL 94V-0)

Weight 31g (1.09oz)

Soldering temperature max. 250 °C / 10 sec.

**Outline Dimensions mm (inches)**



Pin-Out		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	-Vin (GND)	-Vin (GND)
3	+Vout	+Vout
4	No pin	Common
5	-Vout	-Vout

Pin diameter  $\varnothing 1.0 \pm 0.05$  (0.039  $\pm 0.002$ )

Specifications can be changed without notice