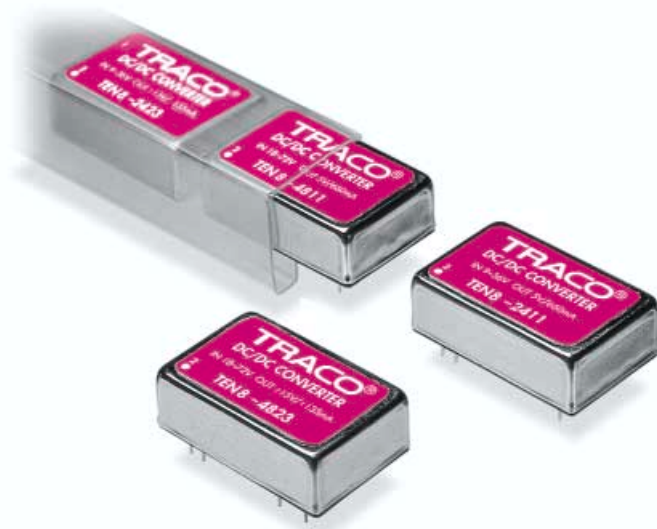


Features

- 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: | 20 mA typ. |
| | 24 Vin models: | 15 mA typ. |
| | 48 Vin models: | 10 mA typ. |
| Input current (full load) | 12 Vin; 3.3 Vout models: | 700 mA typ. |
| | 12 Vin; other output models: | 820 mA typ. |
| | 24 Vin; 3.3 Vout models: | 350 mA typ. |
| | 24 Vin; other output models: | 400 mA typ. |
| | 48 Vin; 3.3 Vout models: | 170 mA typ. |
| | 48 Vin; other output models: | 200 mA typ. |
| Surge voltage (100 msec. max.) | 12 Vin models: | 36 V max. |
| | 24 Vin models: | 50 V max. |
| | 48 Vin models: | 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. | ± 0.2 % max. |
| | – Load variation 25 – 100 % | |
| | – single output models | ± 0.2 % max. |
| | – dual output models balanced load | ± 1.0 % max. |
| | – dual output models unbalanced load | ± 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: | 3300 µF max. |
| | 5 Vout models / ± 5 Vout models: | 1600 µF max. / ± 1000 µF max. |
| | 12 Vout models / ± 12 Vout models: | 350 µF max. / ± 160 µF max. |
| | 15 Vout models / ± 15 Vout models: | 240 µF max. / ± 100 µF max. |

General Specifications

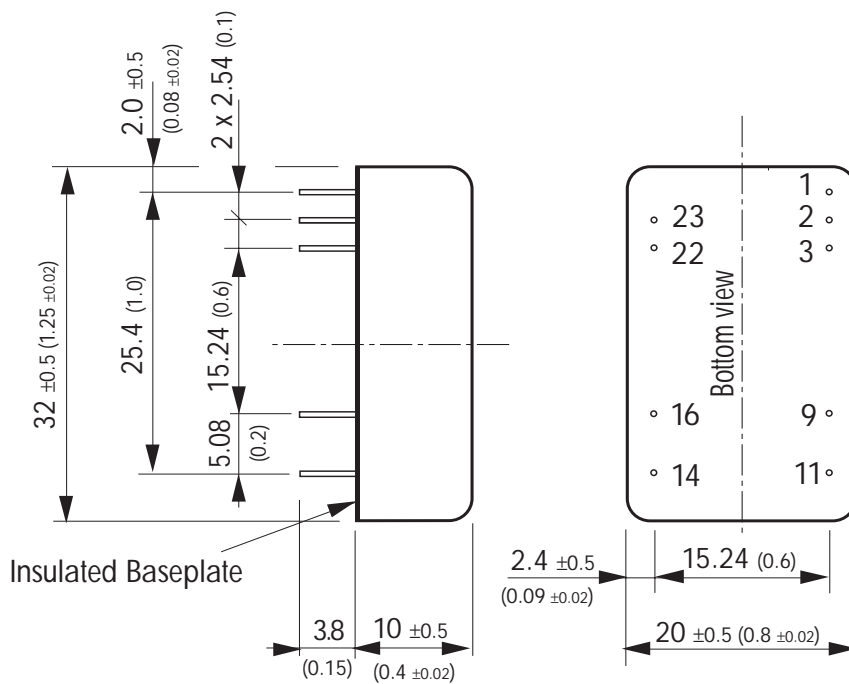
| | | |
|---|---|--|
| Temperature ranges | – Operating | – 25 °C ... + 71 °C (no derating) |
| | – Case temperature | + 100 °C max. |
| | – Storage | – 55 °C ... + 105 °C |
| Humidity (non condensing) | 95 % rel H max. | |
| Reliability, calculated MTBF (MIL-HDBK-217 E) | >715'000 h @ + 25 °C | |
| 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) | |
| Remote ON/OFF (optional): | – ON: | 3.5 ... 12 VDC or open circuit. |
| | – OFF: | 0 ... 1.2 VDC or short circuit pin 1 and pin 2/3 |
| | – OFF idle current: | 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 (flammability to UL 94V-0) |
| 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 ± 0.5 (0.02)

Specifications can be changed without notice