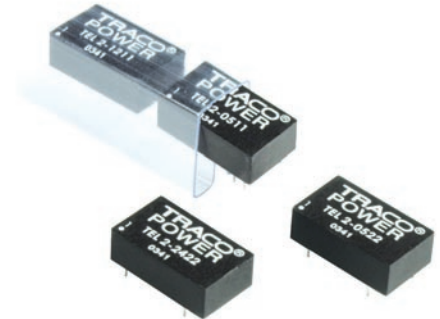


Features

- ◆ Ultracompact DIP-16 plastic package
- ◆ Wide 2:1 input range
- ◆ Regulated output
- ◆ I/O isolation 1500V
- ◆ Input filter meets EN55022, class A without ext. components
- ◆ Low ripple and noise
- ◆ Indefinite shortcircuit protection
- ◆ Operating temperature range -40°C to +75°C
- ◆ Lead free design, RoHS compliant
- ◆ 3-year product warranty



The TEL-2 series, comprising 28 models, is a range of isolated 2 Watt converters in a low profile DIP-16 package. Requiring only 3.25 cm² of space on the PCB they provide a complete DC/DC converter without need of any external components. Wide input range and tightly regulated output voltage qualifies these converters for many cost critical applications in industrial and consumer electronics.

Models

| Ordercode | Input voltage range | Output voltage | Output current max. | Efficiency typ. |
|------------|--|----------------|---------------------|-----------------|
| TEL 2-0510 | 4.5 – 9 VDC (nominal 5 VDC) | 3.3 VDC | 500 mA | 70 % |
| TEL 2-0511 | | 5 VDC | 400 mA | 73 % |
| TEL 2-0512 | | 12 VDC | 165 mA | 75 % |
| TEL 2-0513 | | 15 VDC | 135 mA | 73 % |
| TEL 2-0521 | | ±5 VDC | ±200 mA | 64 % |
| TEL 2-0522 | | ±2 VDC | ±85 mA | 69 % |
| TEL 2-0523 | | ±15 VDC | ±65 mA | 71 % |
| TEL 2-1210 | 9 – 18 VDC (nominal 12 VDC) | 3.3 VDC | 500 mA | 73 % |
| TEL 2-1211 | | 5 VDC | 400 mA | 77 % |
| TEL 2-1212 | | 12 VDC | 165 mA | 80 % |
| TEL 2-1213 | | 15 VDC | 135 mA | 80 % |
| TEL 2-1221 | | ±5 VDC | ±200 mA | 73 % |
| TEL 2-1222 | | ±12 VDC | ±85 mA | 78 % |
| TEL 2-1223 | | ±15 VDC | ±65 mA | 78 % |
| TEL 2-2410 | 18 – 36 VDC (nominal 24 VDC) | 3.3 VDC | 500 mA | 72 % |
| TEL 2-2411 | | 5 VDC | 400 mA | 77 % |
| TEL 2-2412 | | 12 VDC | 165 mA | 80 % |
| TEL 2-2413 | | 15 VDC | 135 mA | 81 % |
| TEL 2-2421 | | ±5 VDC | ±200 mA | 74 % |
| TEL 2-2422 | | ±12 VDC | ±85 mA | 78 % |
| TEL 2-2423 | | ±15 VDC | ±65 mA | 80 % |
| TEL 2-4810 | 36 – 75 VDC (nominal 48 VDC) | 3.3 VDC | 500 mA | 71 % |
| TEL 2-4811 | | 5 VDC | 400 mA | 73 % |
| TEL 2-4812 | | 12 VDC | 165 mA | 79 % |
| TEL 2-4813 | | 15 VDC | 135 mA | 79 % |
| TEL 2-4821 | | ±5 VDC | ±200 mA | 71 % |
| TEL 2-4822 | | ±12 VDC | ±85 mA | 77 % |
| TEL 2-4823 | | ±15 VDC | ±65 mA | 77 % |

Input Specifications

| | |
|---|---|
| Input current at full load / full load (nominal input) | 5 Vin models: 600 mA / 40 mA typ. 12 Vin models: 220 mA / 20 mA typ. 24 Vin models: 110 mA / 10 mA typ. 48 Vin models: 55 mA / 8 mA typ. |
| Start-up voltage / under voltage shut down | 5 Vin models: 4 VDC / 3.5 VDC typ. 12 Vin models: 7 VDC / 6.5 VDC typ. 24 Vin models: 12 VDC / 11 VDC typ. 48 Vin models: 24 VDC / 22 VDC typ. |
| Surge voltage (100 msec. max.) | 5 Vin models: 11 V max. 12 Vin models: 25 V 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 | ±2 % max. |
| Regulation | – Input variation Vin min. to Vin max. 0.5 % max. – Load variation 25 – 100 % single output models: 0.75 % max. dual output models: 2.0 % (balanced load) |
| Ripple and noise (20 MHz Bandwidth) | 50 mVpk-pk max |
| Temperature coefficient | ±0.02 %/K |
| Short circuit protection | indefinite, automatic recovery |
| Minimum load | 25 % of rated max current (operation at lower load condition is safe but a higher output ripple will be experienced) |
| Capacitive load | 3.3 VDC output models: 2'200 µF max. 5 VDC output models: 1'000 µF max. 12 VDC output models: 170 µF max. 15 VDC output models: 110 µF max. ±5 VDC output models: 470 µF max. ±12 VDC output models: 100 µF max. ±15 VDC output models: 47 µF max. |

General Specifications

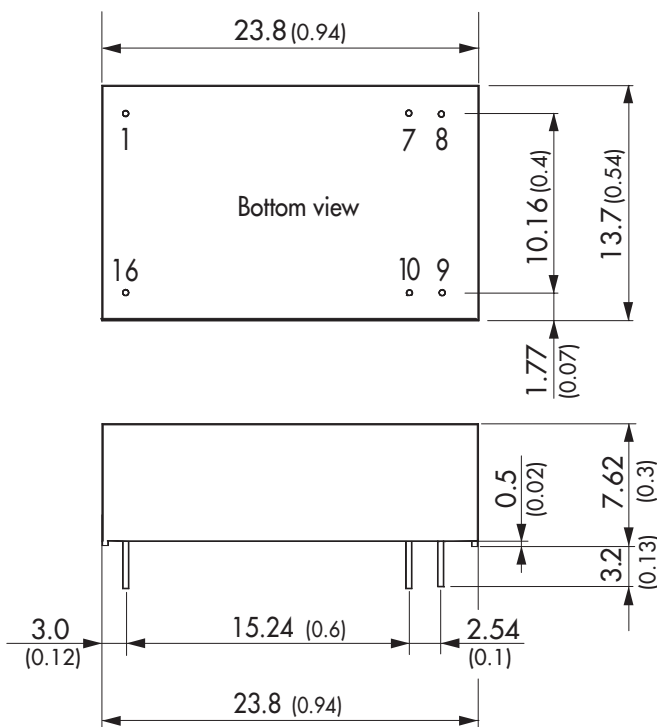
| | |
|--|--|
| Temperature ranges | – Operating –55°C to +125°C – Storage –40°C to +75°C (no derating) |
| Humidity (non condensing) | 95 % rel. H max. |
| Reliability, calculated MTBF (MIL-HDBK-217F, @ +25°C, ground benign) | >1.2 Mio h |
| Isolation voltage | Input/Output (60 sec.) 1'500 VDC |
| Isolation capacity | Input/Output 250 pF max. |
| Isolation resistance | Input/Output (500 VDC) >1'000 M Ohm |
| Switching frequency | 300 kHz (PFM) |
| Safety standards | UL/cUL 60950-1 , IEC/EN 60950-1 |
| Safety approval | CSA 60950-1-03 (File no. 226037) www.tracopower.com/products/tel2_csa.pdf |

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

Physical Specifications

| | |
|-----------------------|------------------------|
| Casing material | non conductive FR4 |
| Potting material | epoxy, UL94V-0 - rated |
| Weight | 5.1 g (0.17oz) |
| Soldering temperature | max. 265°C / 10 sec. |

Outline Dimensions mm (inches)



| Pin-Out | | |
|---------|------------|------------|
| Pin | Single | Dual |
| 1 | -Vin (GND) | -Vin (GND) |
| 7 | No con. | No con. |
| 8 | No con. | Common |
| 9 | +Vout | +Vout |
| 10 | -Vout | -Vout |
| 16 | +Vin | +Vin |

Pin diameter $\varnothing 0.5 \pm 0.05$ (0.02) ± 0.002
Tolerances ± 0.25 (± 0.01)

Specifications can be changed any time without notice.