

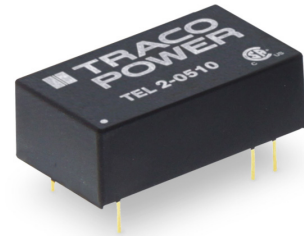


**THE DATASHEET OF
TEL 2-1210**



Features

- ◆ Ultracompact DIP-16 plastic package
- ◆ Wide 2:1 input range
- ◆ Regulated output
- ◆ I/O isolation 1500V
- ◆ Input filter meets EN55032, class A without ext. components
- ◆ Low ripple and noise
- ◆ Indefinite shortcircuit protection
- ◆ Operating temperature range -40°C to +80°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 | | ±12 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 / no 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 ms 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. |
| Conducted noise (input) | EN 55032 class 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

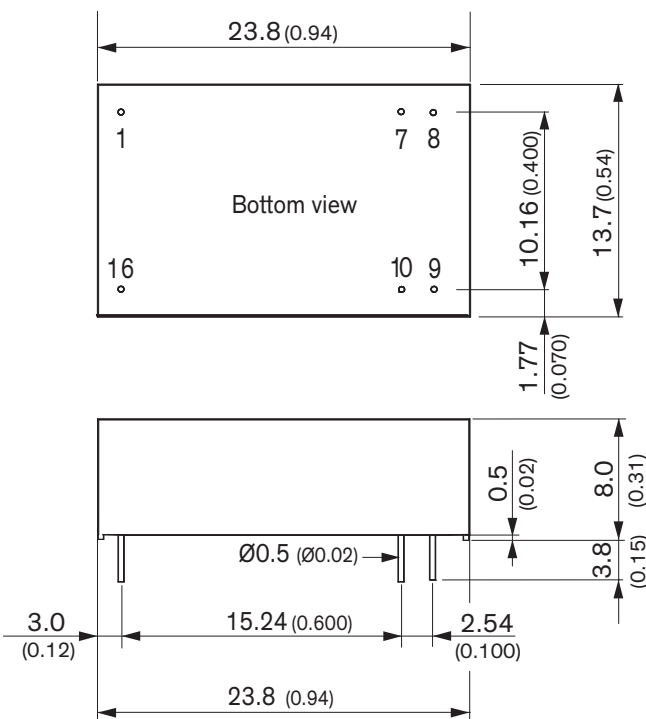
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|---|--------------------------------|--|
| Temperature ranges | – Operating | –40°C to +80°C |
| | – Case | +100°C max. |
| | – Storage | –55°C to +105°C |
| Derating | 2.9 %/K above 65°C | |
| Humidity (non condensing) | 95 % rel. H max. | |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | >1.2 Mio h | |
| Isolation voltage | Input/Output (60 s) | 1'500 VDC |
| Isolation capacitance | Input/Output | 250 pF max. |
| Isolation resistance | Input/Output (500 VDC) | >1'000 MOhm |
| Switching frequency | 150 - 550 kHz (PFM) | |
| | 300 kHz typ. (PFM) | |
| Safety standards | UL/cUL 60950-1, IEC/EN 60950-1 | |
| Safety approval | CB 60950-1 | |
| | – Certification documents | www.tracopower.com/overview/tel2 |
| Environmental compliance | – Reach | www.tracopower.com/info/reach-declaration.pdf |
| | – RoHS | RoHS directive 2011/65/EU |

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 | 265°C / 10 s max. |

Outline Dimensions mm (inches)





| Pin-Out | | |
|---------|------------|------------|
| Pin | Single | Dual |
| 1 | -Vin (GND) | -Vin (GND) |
| 7 | NC | NC |
| 8 | NC | Common |
| 9 | +Vout | +Vout |
| 10 | -Vout | -Vout |
| 16 | +Vin | +Vin |

NC = Not connected

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

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

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