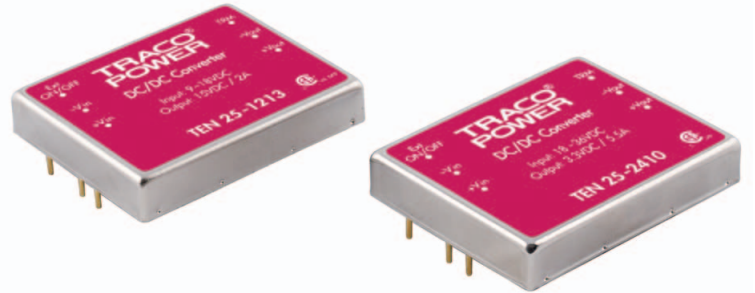


#### Features

- ◆ Wide 2:1 input range
- ◆ Very high efficiency up to 89%
- ◆ Extended operating temperature range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- ◆ Adjustable output voltage
- ◆ Remote On/Off
- ◆ Continuous short circuit protection
- ◆ Over voltage protection
- ◆ I/O isolation 1500 VDC
- ◆ Input filter meets EN 55022, Class A and FCC, Level A without external components
- ◆ Lead free design - RoHS compliant
- ◆ 3-year product warranty

*not recommended for new design in*



The TEN 25 series is a range of isolated DC/DC converters with high power density in a 51x41x9.5mm shielded metal case. All 18 models have a wide 2:1 input voltage range. The very high efficiency allows a safe operating temperature range of  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . Other features are internal EMI-filter to meet EN55022, class A and remote On/Off. Typical applications for these converter modules are industrial electronics, communication systems, battery operated equipment and distributed power systems.

#### Models

| Ordercode   | Input voltage range                    | Output voltage | Output current max. | Efficiency typ. |
|-------------|--|----------------|---------------------|-----------------|
| TEN 25-1210 | <b>9 – 18 VDC</b><br>(12 VDC nominal)  | 3.3 VDC        | 5'500 mA            | 81 %            |
| TEN 25-1211 |  | 5 VDC          | 5'000 mA            | 84 %            |
| TEN 25-1212 |  | 12 VDC         | 2'500 mA            | 88 %            |
| TEN 25-1213 |  | 15 VDC         | 2'000 mA            | 88 %            |
| TEN 25-1222 |  | $\pm 12$ VDC   | $\pm 1'250$ mA      | 88 %            |
| TEN 25-1223 |  | $\pm 15$ VDC   | $\pm 1'000$ mA      | 88 %            |
| TEN 25-2410 | <b>18 – 36 VDC</b><br>(24 VDC nominal) | 3.3 VDC        | 5'500 mA            | 82 %            |
| TEN 25-2411 |  | 5 VDC          | 5'000 mA            | 85 %            |
| TEN 25-2412 |  | 12 VDC         | 2'500 mA            | 89 %            |
| TEN 25-2413 |  | 15 VDC         | 2'000 mA            | 89 %            |
| TEN 25-2422 |  | $\pm 12$ VDC   | $\pm 1'250$ mA      | 89 %            |
| TEN 25-2423 |  | $\pm 15$ VDC   | $\pm 1'000$ mA      | 89 %            |
| TEN 25-4810 | <b>36 – 75 VDC</b><br>(48 VDC nominal) | 3,3 VDC        | 5'500 mA            | 82 %            |
| TEN 25-4811 |  | 5 VDC          | 5'000 mA            | 85 %            |
| TEN 25-4812 |  | 12 VDC         | 2'500 mA            | 89 %            |
| TEN 25-4813 |  | 15 VDC         | 2'000 mA            | 89 %            |
| TEN 25-4822 |  | $\pm 12$ VDC   | $\pm 1'250$ mA      | 89 %            |
| TEN 25-4823 |  | $\pm 15$ VDC   | $\pm 1'000$ mA      | 89 %            |

### Input Specifications

|  |  |   |
|--|--|---|
| Input current no load                      |  | 12 Vin models: 40 mA max.<br>24 Vin models: 20 mA max.<br>48 Vin models: 10 mA max.   |
| Input current (full load)                  | 12 Vin;<br>12 Vin;<br>24 Vin;<br>24 Vin;<br>48 Vin;<br>48 Vin; | 3.3/ 5 VDC models: 1870 mA typ. / 2480 mA typ.<br>other output models: 2840 mA typ.<br>3.3/ 5 VDC models: 920 mA typ. / 1220 mA typ.<br>other output models: 1400 mA typ.<br>3.3/ 5 VDC models: 460 mA typ. / 610 mA typ.<br>other output models: 700 mA typ. |
| Start-up voltage / under voltage shut down |  | 12 Vin models: 8.8 VDC / 8.3 VDC typ.<br>24 Vin models: 17.5 VDC / 16.5 VDC typ.<br>48 Vin models: 35.0 VDC / 33.0 VDC typ.   |
| Surge voltage<br>(1000 msec. max.)         |  | 12 Vin models: 25 V max.<br>24 Vin models: 50 V max.<br>48 Vin models: 100 V max.   |
| Conducted noise (input)                    |  | EN 55022 class A, FCC part 15, level A  |

### Output Specifications

|                                     |   |  |
|-------------------------------------|---|--|
| Voltage set accuracy                |   | ±1 %   |
| Output voltage adj. range           |   | ±10 %  |
| Regulation                          | – Input variation Vin min. to Vin max.<br>– Load variation 10 – 100 % | 0.3 % max.<br>0.5 % max.<br>1.0 % max.<br>2.0 % max. |
| Ripple and noise (20 MHz Bandwidth) |   | 80 mVpk-pk max.                                      |
| Temperature coefficient             |   | ±0.02 %/K  |
| Output current limitation           |   | >110 % of I <sub>out</sub> max., constant current    |
| Short circuit protection            |   | indefinite, automatic recovery                       |
| Capacitive load                     | single output models:<br>dual output models:                          | 470 µF<br>220 µF (for each output)                   |

### General Specifications

|   |  |  |
|---|--|--|
| Temperature ranges  | – Operating<br>– Case temperature<br>– Storage | –40°C to +85°C<br>+105°C max.<br>–55°C to +125°C   |
| Load derating   | – without heatsink<br>– with heatsink          | 2.2 %/K above +60°C<br>3.3 %/K above +70°C   |
| Humidity (non condensing)   |  | 95 % rel H max.  |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) |  | >550'000 h   |
| Isolation voltage (60 sec.)   | – Input/Output                                 | 1'500 VDC  |
| Isolation capacitance   | – Input/Output                                 | 1200 pF typ.   |
| Isolation resistance  | – Input/Output (500 VDC)                       | >1'000 MΩ  |
| Switching frequency (fixed)   |  | 330 kHz typ. (puls width modulation)   |
| Remote On/Off:  | – On:<br>– Off:<br>– Standby current:          | 2.5...100 VDC or open circuit.<br>–0.7...1.0 VDC or short circuit pin 3 and pin 2<br>5 mA max.                         |
| Safety standards  |  | UL /cUL 60950, IEC/EN 60950 compliance up to 60 VDC input voltage (SELV limit)   |
| Safety approvals  |  | CSA File No. 226037<br><a href="http://directories.csa-international.org">http://directories.csa-international.org</a> |

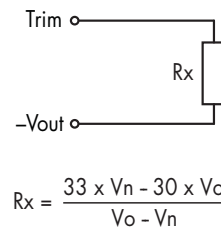
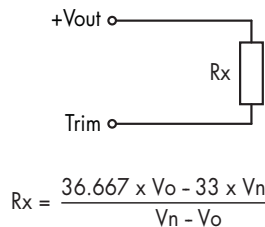
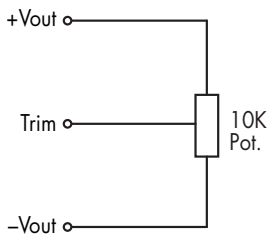
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

**Physical Specifications**

|                          |   |
|--------------------------|---|
| Casing material          | copper, nickel plated   |
| Baseplate                | non conductive FR4  |
| Potting material         | silicon rubber (UL 94 V-0 rated)  |
| Weight                   | 48 g (1.69 oz)  |
| Soldering temperature    | max. 265°C / 10 sec.  |
| Environmental compliance | - Reach<br>- RoHS   |
|                          | <a href="http://www.tracopower.com/products/ten25-reach.pdf">www.tracopower.com/products/ten25-reach.pdf</a><br>RoHS directive 2011/65/EU |

**Application note:** [www.tracopower.com/products/ten25-application.pdf](http://www.tracopower.com/products/ten25-application.pdf)

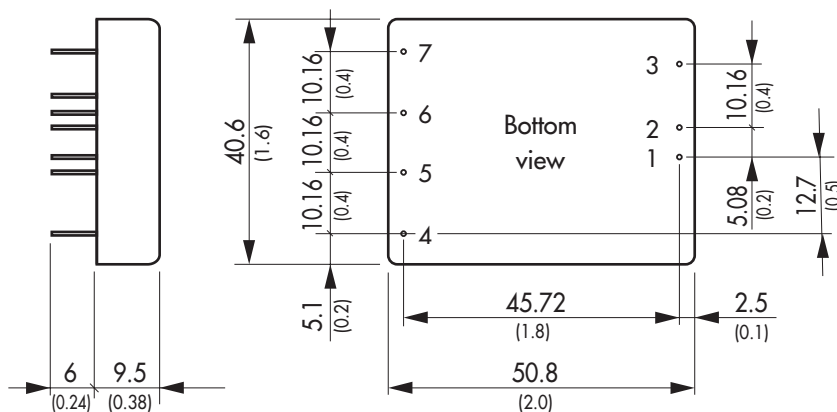
**Output Voltage Adjustments**



$V_o$  = adjusted output voltage [VDC]  
 $V_n$  = nominal output voltage [VDC]  
 $R_x$  = trim resistor [Kohm]

Nominal output voltage at open Trim input.

**Outline Dimensions**



| Pin-Out |               |            |
|---------|---------------|------------|
| Pin     | Single        | Dual       |
| 1       | +Vin (Vcc)    | +Vin (Vcc) |
| 2       | -Vin (GND)    | -Vin (GND) |
| 3       | Remote On/Off |            |
| 4       | No pin        | +Vout      |
| 5       | +Vout         | Common     |
| 6       | -Vout         | -Vout      |
| 7       | Trim          |            |

Dimensions in [mm], ( ) = Inch  
 Pin diameter: 1.0 ±0.05 (0.04 ±0.002)  
 Pin pitch tolerances: ±0.25 (±0.01)  
 Case tolerances: ±0.5 (±0.02)

Optional heat-sink see: [www.tracopower.com/products/heatsinks.pdf](http://www.tracopower.com/products/heatsinks.pdf)

Specifications can be changed any time without notice.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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