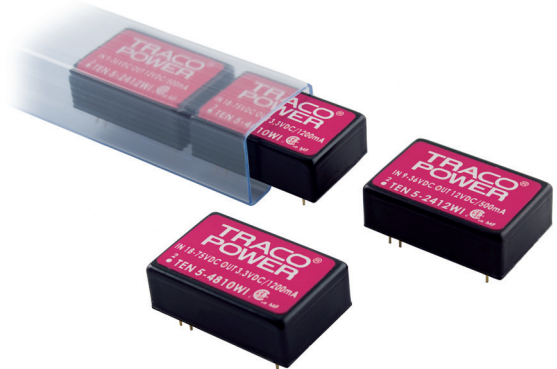


#### Features

- ◆ Ultra wide 4:1 input range
- ◆ DIP-24 Package with standard pinout
- ◆ Full SMD design
- ◆ Extended operating temperature range  
-40°C to +85°C max.
- ◆ High efficiency
- ◆ Excellent load and line regulation
- ◆ Indefinite short circuit protection
- ◆ I/O isolation 1500VDC
- ◆ Built-in Filter to meet EN 55022, Class A  
and FCC, level A
- ◆ Lead-free design, fully RoHS compliant
- ◆ 3-year product warranty



The TEN 5WI series is a family of high performance dc-dc converter modules with 5 W output power, featuring ultra wide input voltage ranges of 9 - 36 VDC or 18 - 75 VDC. They come in a shielded DIP-24 metal package with industry-standard footprint.

A high efficiency allows -40°C to +70°C operation ambient temperatures at full load. Typical applications for these converters are battery operated equipment and distributed power architectures in communication, instrumentation and industrial electronics, everywhere where a wide input voltage range is required.

#### Models

| Ordercode    | Input voltage range             | Output voltage | Output current max. | Efficiency typ. |
|--------------|---------------------------------|----------------|---------------------|-----------------|
| TEN 5-2410WI | 9 – 36 VDC<br>(24 VDC nominal)  | 3.3 VDC        | 1200 mA             | 75 %            |
| TEN 5-2411WI |                                 | 5 VDC          | 1000 mA             | 78 %            |
| TEN 5-2412WI |                                 | 12 VDC         | 500 mA              | 83 %            |
| TEN 5-2413WI |                                 | 15 VDC         | 400 mA              | 82 %            |
| TEN 5-2421WI |                                 | ±5 VDC         | ±500 mA             | 78 %            |
| TEN 5-2422WI |                                 | ±12 VDC        | ±250 mA             | 83 %            |
| TEN 5-2423WI |                                 | ±15 VDC        | ±200 mA             | 82 %            |
| TEN 5-4810WI | 18 – 75 VDC<br>(48 VDC nominal) | 3.3 VDC        | 1200 mA             | 75 %            |
| TEN 5-4811WI |                                 | 5 VDC          | 1000 mA             | 78 %            |
| TEN 5-4812WI |                                 | 12 VDC         | 500 mA              | 83 %            |
| TEN 5-4813WI |                                 | 15 VDC         | 400 mA              | 82 %            |
| TEN 5-4821WI |                                 | ±5 VDC         | ±500 mA             | 78 %            |
| TEN 5-4822WI |                                 | ±12 VDC        | ±250 mA             | 83 %            |
| TEN 5-4823WI |                                 | ±15 VDC        | ±200 mA             | 82 %            |

## Input Specifications

|                                               |               |                                        |
|-----------------------------------------------|---------------|----------------------------------------|
| Input current no load                         | 24 Vin models | 20 mA typ.                             |
|                                               | 48 Vin models | 10 mA typ.                             |
| Start-up voltage /<br>under voltage shut down | 24 Vin models | 9 VDC / 8.5 VDC typ.                   |
|                                               | 48 Vin models | 18 VDC / 16 VDC typ.                   |
| Surge voltage (1 sec. 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                |                                        | ±2.0 % max.                                            |
| Regulation                          | – Input variation Vin min. to Vin max. | ±0.5 % max.                                            |
|                                     | – Load variation 10 – 100 %            |                                                        |
|                                     | single output models                   | 1.0 % max.                                             |
|                                     | dual output models<br>25 – 100 %       | 1.0 % max. balanced load<br>5.0 % max. unbalanced load |
| Ripple and noise (20 MHz Bandwidth) |                                        | 80 mVpk-pk max                                         |
| Temperature coefficient             |                                        | ±0.02 %/K                                              |
| Current limitation                  |                                        | >110 % of Iout max., constant current                  |
| Short circuit protection            |                                        | indefinite (automatic recovery)                        |
| Capacitive load                     | 3.3 / 5 VDC models                     | 470 µF max.                                            |
|                                     | 12 / 15 VDC models                     | 100 µF max.                                            |
|                                     | dual output models                     | 100 µF max.                                            |

## General Specifications

|                                                                       |                          |                                                                                                                                          |
|-----------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature ranges                                                    | – Operating              | –40°C to +85°C                                                                                                                           |
|                                                                       | – Case temperature       | +100°C max.                                                                                                                              |
|                                                                       | – Storage                | –40°C to +125°C                                                                                                                          |
| Derating                                                              |                          | 3.5 %/K above +70°C                                                                                                                      |
| Humidity (non condensing)                                             |                          | 95 % rel H max.                                                                                                                          |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) |                          | >800'000 h                                                                                                                               |
| Isolation voltage (60 sec.)                                           | – Input/Output           | 1'500 VDC                                                                                                                                |
| Isolation capacitance                                                 | – Input/Output           | 1000 pF typ                                                                                                                              |
| Isolation resistance                                                  | – Input/Output (500 VDC) | >1'000 M Ohm                                                                                                                             |
| Switching frequency                                                   |                          | 450 kHz typ. (Pulse frequency modulation PFM)                                                                                            |
| Safety standards                                                      |                          | cUL/UL 60950-1 , IEC/EN 60950-1                                                                                                          |
| Environmental compliance                                              | – Reach                  | <a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a><br>directive 2011/65/EU |
|                                                                       | – RoHS                   |                                                                                                                                          |

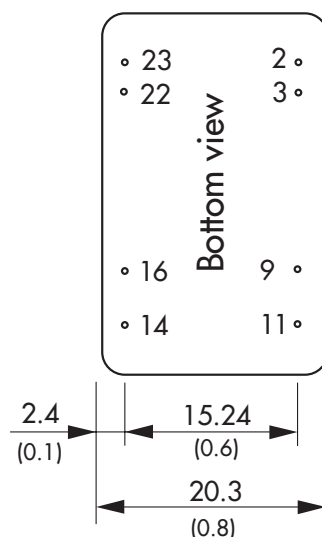
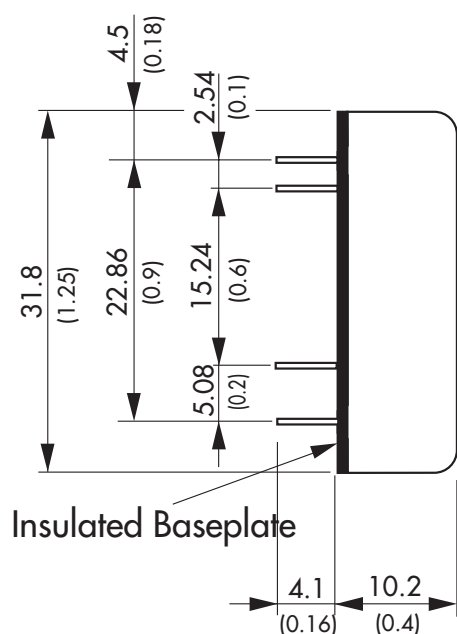
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

## Physical Specifications

|                       |                          |
|-----------------------|--------------------------|
| Casing material       | black anodized aluminium |
| Baseplate material    | non conductive FR4       |
| Potting material      | epoxy (UL 94V-0 rated)   |
| Weight                | 17 g (0.49 oz)           |
| Soldering temperature | max. 260°C / 10 sec.     |

**Supporting documents:** [www.tracopower.com/overview/ten5wi](http://www.tracopower.com/overview/ten5wi)

## Outline Dimensions



| Pin-Out |             |            |
|---------|-------------|------------|
| Pin     | Single      | Dual       |
| 2       | -Vin (GND)  | -Vin (GND) |
| 3       | -Vin (GND)  | -Vin (GND) |
| 9       | No pin      | Common     |
| 11      | No function | -Vout      |
| 14      | +Vout       | +Vout      |
| 16      | -Vout       | Common     |
| 22      | +Vin (Vcc)  | +Vin (Vcc) |
| 23      | +Vin (Vcc)  | +Vin (Vcc) |

Dimensions in [mm], ( ) = Inch  
Pin diameter  $\varnothing 0.5 \pm 0.05$  ( $0.02 \pm 0.002$ )  
Tolerances  $\pm 0.5$  ( $\pm 0.02$ )  
Pin pitch tolerances  $\pm 0.35$  ( $\pm 0.014$ )

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)

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