

### Features

- ◆ Ultrawide 4 : 1 input range
- ◆ Full SMD-design
- ◆ Input filter meets EN 55022, Class A and FCC, level A without external components
- ◆ Indefinite short-circuit protection
- ◆ Overvoltage protection
- ◆ I/O isolation 1500 VDC
- ◆ operating temperature range  
-40°C to 85°C
- ◆ Remote On/Off (optional)
- ◆ Insulated baseplate
- ◆ Industry standard pinout
- ◆ 3-year product warranty

*not recommended for new design in*



The TEN 12WI series is a family 12W DC/DC converter modules featuring ultra wide 4:1 input voltage ranges in a compact 2"x1.0" low profile package with industry-standard footprint.

A high efficiency up to 84% allows operating temperatures from -40°C to +85°C. A built-in EMI input filter complies with EN 55022, class A without any external components.

Further standard features include remote On/Off (optional), over voltage protection and continuous short-circuit protection.

Typical applications for these converters are battery operated equipment and distributed power architectures in communication and industrial electronics, everywhere where isolated, tightly regulated voltages are required.

### Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 12-2410	<b>9 – 36 VDC</b> (24 VDC nominal)	3,3 VDC	2'400 mA	78 %
TEN 12-2411		5 VDC	2'000 mA	82 %
TEN 12-2412		12 VDC	1'000 mA	84 %
TEN 12-2413		15 VDC	800 mA	84 %
TEN 12-2421		±5 VDC	±1'000 mA	82 %
TEN 12-2422		±12 VDC	±500 mA	84 %
TEN 12-2423		±15 VDC	±400 mA	84 %
TEN 12-4810	<b>18 – 75 VDC</b> (48 VDC nominal)	3,3 VDC	2'400 mA	78 %
TEN 12-4811		5 VDC	2'000 mA	82 %
TEN 12-4812		12 VDC	1'000 mA	84 %
TEN 12-4813		15 VDC	800 mA	84 %
TEN 12-4821		±5 VDC	±1'000 mA	82 %
TEN 12-4822		±12 VDC	±500 mA	84 %
TEN 12-4823		±15 VDC	±400 mA	84 %

### Input Specifications

<b>Input current</b> (no load)	24 Vin models: <b>40 mA typ.</b> 48 Vin models: <b>20 mA typ.</b>
<b>Input current</b> (full load)	24 Vin; 3.3 Vout models: <b>425 mA typ.</b> 24 Vin; 5 & ±5 Vout models: <b>510 mA typ.</b> 24 Vin; other output models: <b>600 mA typ.</b> 48 Vin; 3.3 Vout models: <b>215 mA typ.</b> 48 Vin; 5 & ±5 Vout models: <b>255 mA typ.</b> 48 Vin; other output models: <b>300 mA typ.</b>
<b>Surge voltage</b> (1 sec. max.)	24 Vin models: <b>42 V max..</b> 48 Vin models: <b>84 V max.</b>
<b>Conducted noise</b> (input)	EN 55022 level A, FCC part 15, level A

### Output Specifications

<b>Voltage set accuracy</b>	<b>±1 %</b>
<b>Regulation</b>	- Input variation Vin min. to Vin max. <b>±0.5 % max.</b> - Load variation 10 – 90 % <b>±0.5 % max.</b>
<b>Ripple and noise</b> (20 MHz Bandwidth)	<b>50 mVpk-pk typ.</b>
<b>Temperature coefficient</b>	<b>±0.02 %/K</b>
<b>Output current limitation</b>	<b>&gt;110 % of Iout max. foldback</b>
<b>Short circuit protection</b>	<b>indefinite</b> (automatic recovery)
<b>Capacitive load</b>	- single output models <b>470 µF max.</b> - dual output models <b>150 µF max.</b>

### General Specifications

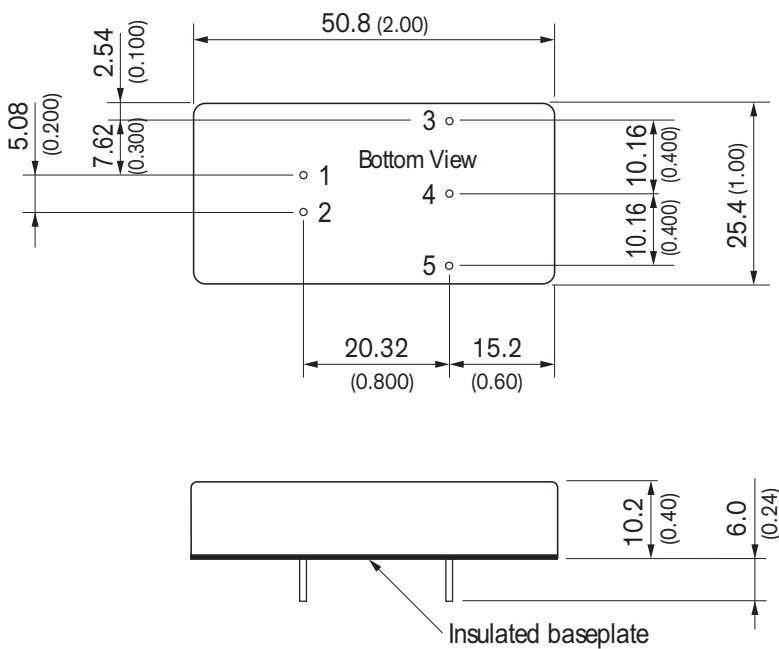
<b>Temperature ranges</b>	- Operating <b>-40°C to +85°C</b> - Case temperature <b>+100°C max.</b> - Storage <b>-55°C to +125°C</b>
<b>Derating above 60°C</b>	<b>2 %/K</b>
<b>Humidity</b> (non condensing)	<b>95 % rel H max.</b>
<b>Reliability, calculated MTBF</b> (MIL-HDBK-217F, at +25°C, ground benign)	<b>&gt;700'000 h</b>
<b>Isolation voltage</b> (60 sec.)	- Input/Output <b>1'500 VDC</b>
<b>Isolation capacitance</b>	- Input/output <b>200 pF typ</b>
<b>Isolation resistance</b>	- Input/Output (500 VDC) <b>&gt;1'000 M Ohm</b>
<b>Switching frequency</b> (fixed)	<b>400 kHz typ.</b> (pulse width modulation PWM)
<b>Remote On/Off</b> (optional):	- On: <b>2.5 ... 5.5 VDC or open circuit.</b> - Off: <b>0 ... 0.8 VDC or short circuit pin 2 and pin 6</b> - Off idle current: <b>10 mA max.</b>
<b>Safety standards:</b>	<b>UL 1950-1, EN 60950, IEC 60950</b> compliance up to 60 VDC input voltage (SELV limit)
<b>Safety approvals:</b>	- UL 1950 (UL 60950-1 not intended) <b><a href="http://www.ul.com">www.ul.com</a> -&gt; certifications -&gt; File e188913</b>
<b>Environmental compliance</b>	- Reach <b><a href="http://www.tracopower.com/products/ten12wi-reach.pdf">www.tracopower.com/products/ten12wi-reach.pdf</a></b> - RoHS <b>RoHS directive 2011/65/EU</b>

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

**Physical Specifications**

Casing material	steel, nickel plated
Baseplate	non conductive FR4
Potting material	silicon rubber (UL 94 V-0 rated)
Weight	30 g (1.2 oz)
Soldering temperature	max. 265°C / 10 sec.

**Outline Dimensions**



Pin-Out		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	-Vin (GND)	-Vin (GND)
3	+Vout	+Vout
4	No pin	Common
5	-Vout	-Vout

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

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