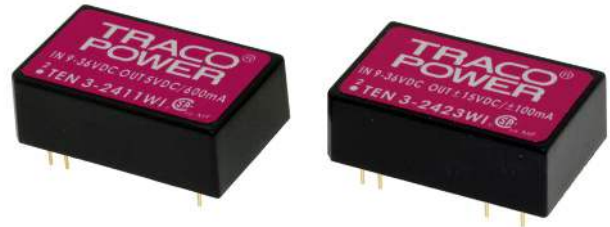


#### Features

- ◆ Ultra-wide 4:1 input range
- ◆ Full SMD-Design
- ◆ High efficiency up to 84%
- ◆ Extended operating temperature range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- ◆ Excellent load and line regulation
- ◆ Indefinite short-circuit protection
- ◆ I/O isolation 1'500 VDC
- ◆ Input filter to meet EN 55022, Class A and FCC, level A without external components
- ◆ Lead free design, fully RoHS compliant
- ◆ 3-year product warranty



The TEN 3WI series is a family of dc-dc converter modules with 3W output power, featuring ultra wide 4:1 input voltage ranges of 9-36VDC or 18-75VDC. They come in a DIP-24 plastic package with industry-standard footprint. A high efficiency up to 84% allows operation ambient temperatures of  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  at full load.

A built-in EMI input filter complies with EN 55022, class A without need of external components. Further standard features include over voltage protection and continuous short circuit protection. Typical applications for these converters are battery operated equipment and distributed power architectures in communication, instrumentation and industrial electronics, everywhere where isolated, tightly regulated voltages are required.

#### Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 3-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	750 mA	75 %
TEN 3-2411WI		5 VDC	600 mA	79 %
TEN 3-2412WI		12 VDC	250 mA	81 %
TEN 3-2413WI		15 VDC	200 mA	82 %
TEN 3-2422WI		$\pm 12$ VDC	$\pm 125$ mA	80 %
TEN 3-2423WI		$\pm 15$ VDC	$\pm 100$ mA	80 %
TEN 3-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	750 mA	76 %
TEN 3-4811WI		5 VDC	600 mA	80 %
TEN 3-4812WI		12 VDC	250 mA	83 %
TEN 3-4813WI		15 VDC	200 mA	84 %
TEN 3-4822WI		$\pm 12$ VDC	$\pm 125$ mA	82 %
TEN 3-4823WI		$\pm 15$ VDC	$\pm 100$ mA	82 %

### Input Specifications

Input current no load /full load	24 Vin models	20 mA typ. / 150 mA typ.
	48 Vin models	10 mA typ. / 75 mA typ.
Start-up voltage / 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.
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.	
	– Load variation 10 – 100 %	
	single output models	1.0 % max.
	dual output models	3.0 % max. (balanced load)
Ripple and noise (20 MHz Bandwidth)	75 mVpk-pk max	
Temperature coefficient	0.02 %/K	
Current limitation	>110 % of Iout max., constant current	
Transient response (25% load step change)	300 µs typ.	
Short circuit protection	indefinite (automatic recovery)	
Capacitive load	3.3 VDC models	680 µF max.
	5 VDC models	470 µF max.
	12 VDC models	330 µF max.
	12 VDC models	220 µF max.
	±12 VDC models	150 µF max. (for each output)
	±15 VDC models	100 µF max. (for each output)

### General Specifications

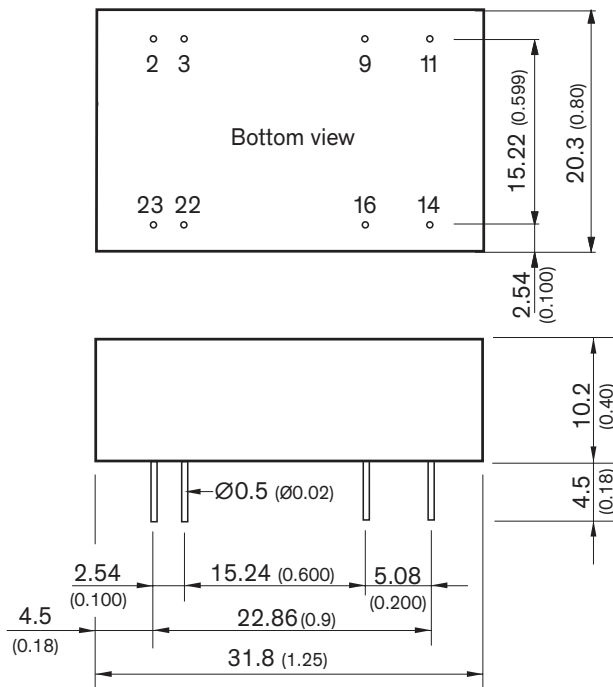
Temperature ranges	– Operating	–40°C to +85°C
	– Casing	+100°C max.
	– Storage	–55°C to +125°C
Derating	3.5 %/K above 70°C	
Humidity (non condensing)	95 % rel H max.	
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)	>1 Mio. h	
Isolation voltage (60 sec.)	– Input/Output	1'500 VDC
Isolation capacitance	– Input/Output	380 pF typ
Isolation resistance	– Input/Output (500 VDC)	>1'000 M Ohm
Switching frequency	250 - 350 kHz (PWM)	
Safety standards	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>
	– 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 black plastic
Potting material	epoxy (UL94V-0 rated)
Weight	12 g (0.42 oz)
Soldering temperature	max. 265°C / 10 sec.

**Outline Dimensions mm (inches)**



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

NC = Not connected

All dimensions in mm (inch)

Tolerances: x.x ±0.25 (x.xx ±0.01)

x.xx ±0.13 (x.xx ±0.005)

Pin diameter tolerances: x.x ±0.5 (x.xx ±0.005)

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