



#### 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
- ◆ Extended Temperature Operating Range -40°C to 85°C
- ◆ Remote On/Off (optional)
- ◆ Insulated Baseplate
- ◆ Industry Standard Pinout
- ◆ 3 Year Product Warranty



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	9 – 36 VDC	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	18 – 75 VDC	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

Input current (no load)	24 Vin models 48 Vin models	40 mA typ. 20 mA typ.
Input current (full load)	24 Vin; 24 Vin; 24 Vin; 48 Vin; 48 Vin; 48 Vin;	3.3 Vout models: 425 mA typ. 5 & ±5 Vout models: 510 mA typ. other output models: 600 mA typ. 3.3 Vout models: 215 mA typ. 5 & ±5 Vout models: 255 mA typ. other output models: 300 mA typ.
Surge voltage (1 sec. max.)	24 Vin models 48 Vin models	42 V max.. 84 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		± 1 %
Regulation	– Input variation Vin min. to Vin max. – Load variation 10 – 90 %	± 0.5 % max. ± 0.5 % max.
Ripple and noise (20 MHz Bandwidth)		50 mVpk-pk typ.
Temperature coefficient		± 0.02 % / K
Output current limitation		>110% of Iout max. foldback
Short circuit protection		indefinite (automatic recovery)
Capacitive load	– single output models – dual output models	470 µF max. 100 µF max.

### General Specifications

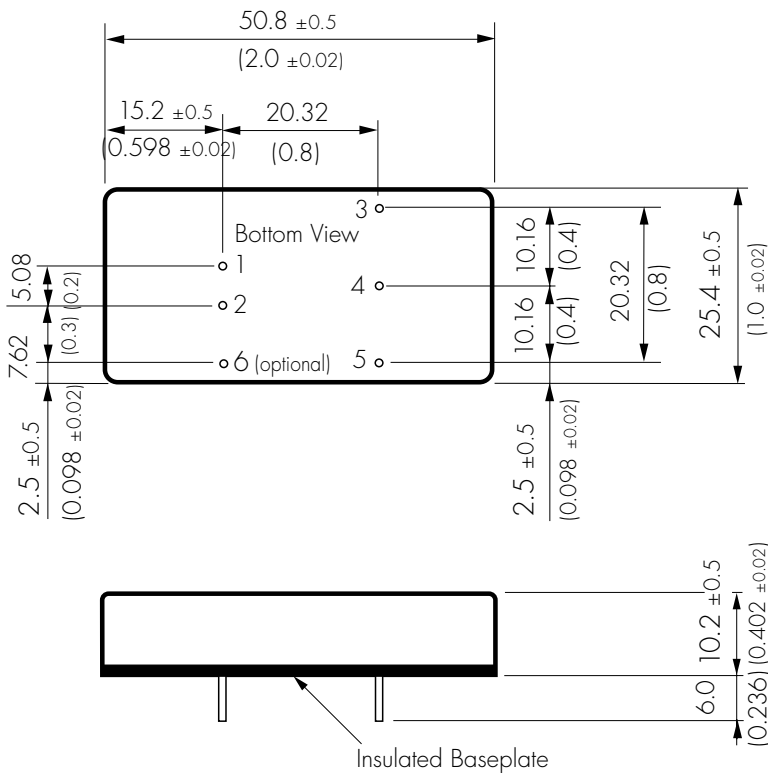
Temperature ranges	– Operating – Case temperature – Storage	– 40 °C ... + 85 °C + 100 °C max. – 55 °C ... + 125 °C
Derating above 60°C		2% / K
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		> 700'000 h @ +25 °C
Isolation voltage (60 sec.)	– Input/Output	1'500 VDC
Isolation capacity	– Input/output)	200 pF typ
Isolation resistance	– Input/Output (500 VDC)	> 1'000 M Ohm
Switching frequency (fixed)		400 kHz typ. (pulse width modulation PWM)
Remote On/Off (optional):	– On: – Off: – Off idle current:	2.5 ... 5.5 VDC or open circuit. 0 ... 0.8 VDC or short circuit pin 2 and pin 6 10 mA max.
Safety standards:		UL 1950, EN 60950, IEC 60950 compliance up to 60 VDC input voltage (SELV limit)
Safety approvals:		cUL/UL File E188913

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

**Physical Specifications**

Case 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 mm (inches)**



Pin diameter  $\varnothing$  1.0 ±0.05 (0.039) ±0.002

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
6	Remote On/Off (optional)	Remote On/Off (optional)

Specifications can be changed without notice