

### 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

Input current (no load)	24 Vin models: 40 mA typ. 48 Vin models: 20 mA typ.
Input current (full load)	24 Vin; 3.3 Vout models: 425 mA typ. 24 Vin; 5 & ±5 Vout models: 510 mA typ. 24 Vin; other output models: 600 mA typ. 48 Vin; 3.3 Vout models: 215 mA typ. 48 Vin; 5 & ±5 Vout models: 255 mA typ. 48 Vin; other output models: 300 mA typ.
Surge voltage (1 sec. max.)	24 Vin models: 42 V max.. 48 Vin models: 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. ±0.5 % max. – Load variation 10 – 90 % ±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 470 µF max. – dual output models 150 µF max.

### General Specifications

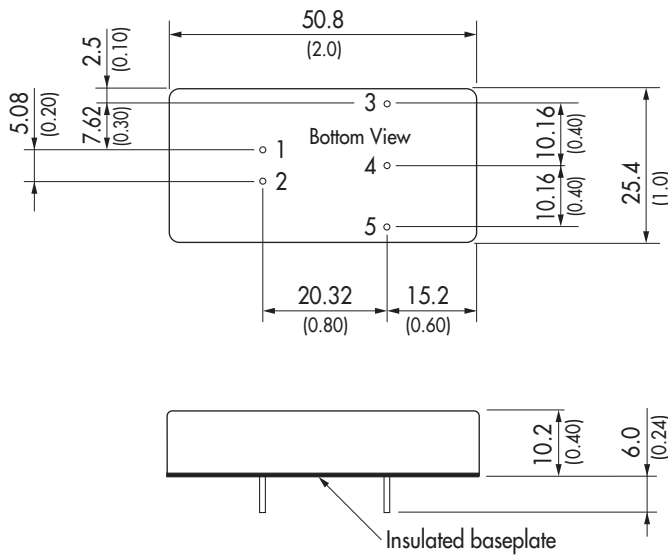
Temperature ranges	– Operating –40°C to +85°C – Case temperature +100°C max. – Storage –55°C to +125°C
Derating above 60°C	2 %/K
Humidity (non condensing)	95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)	>700'000 h
Isolation voltage (60 sec.)	– Input/Output 1'500 VDC
Isolation capacitance	– 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: 2.5 ... 5.5 VDC or open circuit. – Off: 0 ... 0.8 VDC or short circuit pin 2 and pin 6 – Off idle current: 10 mA max.
Safety standards:	UL 1950-1, EN 60950, IEC 60950 compliance up to 60 VDC input voltage (SELV limit)
Safety approvals:	– UL 1950 (UL 60950-1 not intended) <a href="http://www.ul.com">www.ul.com</a> -> certifications -> File e188913
Environmental compliance	– Reach <a href="http://www.tracopower.com/products/ten12wi-reach.pdf">www.tracopower.com/products/ten12wi-reach.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	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], (I) = Inch  
 Pin diameter: 1.0 ±0.05 (0.02 ±0.002)  
 Pin pitch tolerances: ±0.25 (±0.01)  
 Case tolerances: ±0.5 (±0.02)