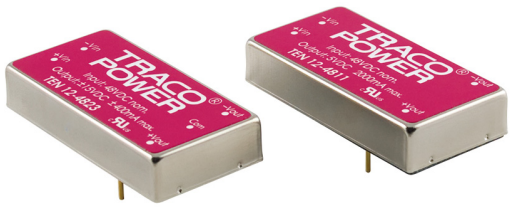
DC/DC Converters

TEN 12WI Series, 12 Watt

(UL1950)

Features

- Ultrawide 4 : 1 input range
- 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



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 (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	18 – 75 VDC (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.**
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

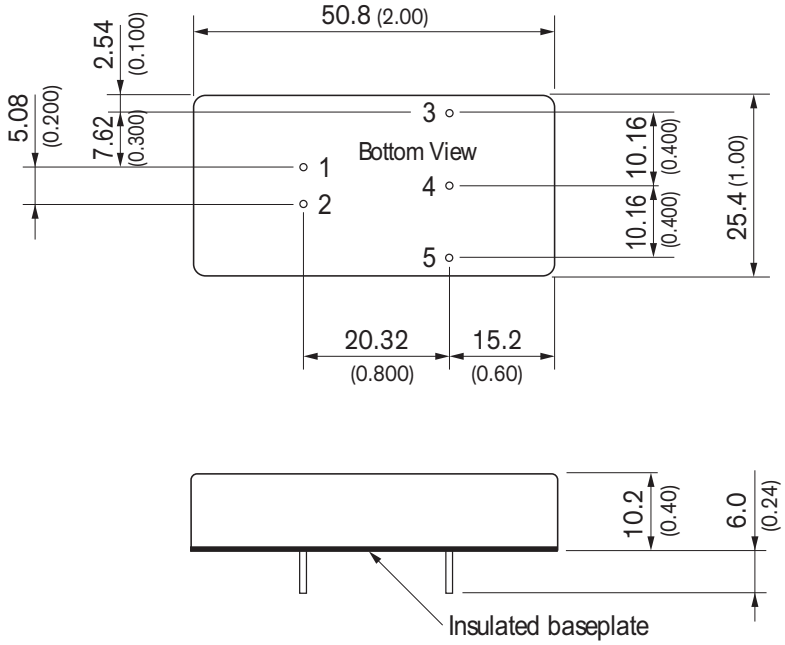
Temperature ranges	– Operating	**–40°C to +85°C**
	– Case temperature	**+100°C max.**
	– Storage	**–55°C to +125°C**
Derating above 60°C		**2 %/K**
Humidity (non condensing)		**95 % rel H max.**
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		**>700'000 h**
Isolation voltage (60 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 60950,1 IEC 60950** compliance up to 60 VDC input voltage (SELV limit)
Safety approvals:	– UL 1950 (UL 60950-1 not intended)	**www.ul.com -> certifications -> File e188913**
Environmental compliance	– Reach	**www.tracopower.com/products/ten12wi-reach.pdf**
	– 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

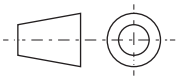
Casing material	steel, nickel plated
Baseplate	non conductive FR4
Potting material	silicon rubber (UL 94 V-0 rated)
Weight	30 g (1.2 oz)
Soldering temperature	max. 265°C / 10 sec.

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

Avoid routing PCB traces under the converter.



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)