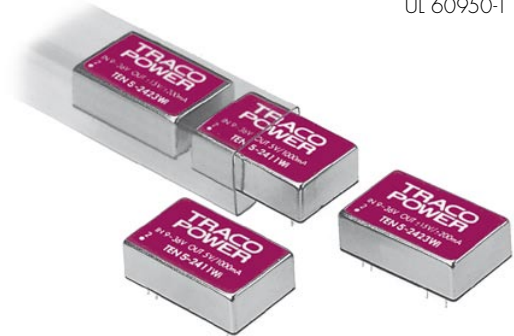




UL 60950-1

#### Features

- ◆ Ultra-wide 4:1 Input Range
- ◆ DIP-24 Package with Standard Pinout
- ◆ Full SMD Design
- ◆ Ext.ended Operating Temperature Range  
-40 to +85°C max.
- ◆ High Efficiency
- ◆ Excellent Load and Line Regulation
- ◆ Indefinite Short-circuit Protection
- ◆ I/O-Isolation 1500VDC
- ◆ Built-inFilter meets EN 55022, Class A and FCC, Level A
- ◆ Lead-free Design, fully RoHS compliant
- ◆ 3 Year Product Warranty



The TEN 5WI series is a family of high performance dc-dc converter modules with 5W output power, featuring ultra wide input voltage ranges of 9-36VDC or 18-75VDC. They come in a shielded DIP-24 metal package with industry-standard footprint.

A high efficiency allows -40°C to +70°C operation ambient temperatures at full load. 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 a wide input voltage range is required.

Models				
Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 5-2410WI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	1200 mA	76 %
TEN 5-2411WI		5 VDC	1000 mA	79 %
TEN 5-2412WI		12 VDC	500 mA	84 %
TEN 5-2413WI		15 VDC	400 mA	83 %
TEN 5-2421WI		± 5 VDC	± 500 mA	79 %
TEN 5-2422WI		± 12 VDC	± 250 mA	84 %
TEN 5-2423WI		± 15 VDC	± 200 mA	83 %
TEN 5-4810WI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	1200 mA	76 %
TEN 5-4811WI		5 VDC	1000 mA	79 %
TEN 5-4812WI		12 VDC	500 mA	84 %
TEN 5-4813WI		15 VDC	400 mA	83 %
TEN 5-4821WI		± 5 VDC	± 500 mA	79 %
TEN 5-4822WI		± 12 VDC	± 250 mA	84 %
TEN 5-4823WI		± 15 VDC	± 200 mA	83 %

### Input Specifications

Input current no load /full load	24 Vin models 48 Vin models	20 mA typ. / 300 mA typ. 10 mA typ. / 150 mA typ.
Start-up voltage / under voltage shut down	24 Vin models 48 Vin models	9 VDC / 8.5 VDC typ. 18 VDC / 16 VDC typ.
Surge voltage (1 sec. max.)	24 Vin models 48 Vin models	50 V max. 100 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		± 2.0 % max.
Regulation	– Input variation Vin min. to Vin max. – Load variation 10 – 100 %	0.3 % max.
	single output models dual output models	2.0 % max. 2.0 % max. balanced load 3.0 % max. unbalanced load
Ripple and noise (20 MHz Bandwidth)		75 mVpk-pk max
Temperature coefficient		± 0.02 % / K
Current limitation		> 110% of Iout max., constant current
Short circuit protection		indefinite (automatic recovery)
Capacitive load	3.3 /5 VDC models 12 /15 VDC models ±5 VDC models ±12 /±15 VDC models	1000 µF max. 470 µF max. 220 µF max. (for each output) 100 µF max. (for each output)

### General Specifications

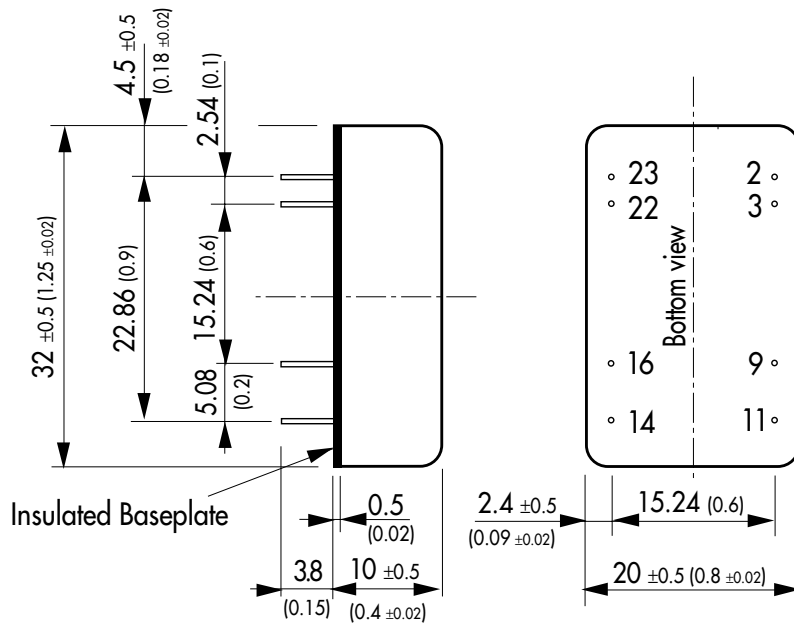
Temperature ranges	– Operating – Case temperature – Storage	– 40 °C ... + 85 °C + 100 °C max. – 55 °C ... + 125 °C
Derating		3.5% /K above 70°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217E ground benign)		>1 Mio. h @ + 25 °C
Isolation voltage (60 sec)	– Input/Output	1'500 VDC
Isolation capacity	– Input/Output	350 pF typ
Isolation resistance	– Input/Output (500 VDC)	> 1'000 M Ohm
Switching frequency		300 kHz typ. (Pulse frequency modulation PFM)
Safety standards		UL 60950-1 , IEC 60950-1, EN 60950-1
Safety approvals		CSA File No. 226037

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 material	non conductive FR4
Potting material	Epoxy (UL 94V-0 rated)
Weight	17 g (0.49 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	No function	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02  $\pm$  0.002)  
Tolerances  $\pm 0.5$  (0.02)

Specifications can be changed any time without notice