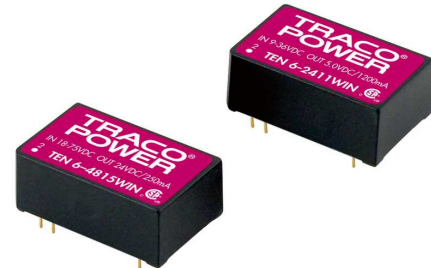


### Features

- ◆ Wide 4:1 input voltage range
- ◆ High efficiency
- ◆ Operating temperature range  
-40°C to +85°C
- ◆ No minimum load required
- ◆ Models with 1'500 VDC and 3'000 VDC  
I/O isolation (functional insulation)
- ◆ Input filter meets EN 55022, class A
- ◆ Overload protection
- ◆ DIP-24 plastic package
- ◆ Industry standard pinout
- ◆ 3-year product warranty



The TEN-6WIN series is designed for an optimized cost/performance ratio of DC/DC converters with output power of 6 Watt.

General features like no minimum load requirement, overload protection, internal filter for EN55022 class A and high efficiency make these converters easy to design in. With the popular DIP-24 standard package they are also a drop in replacement for many cost critical applications.

### Models

Order code		Input voltage range	Output voltage	Output current max.	Efficiency typ.
1'500 VDC isolation	3'000 VDC isolation				
TEN 6-2410WIN	TEN 6-2410WIN-HI	9 – 36 VDC (24 VDC nominal)	3.3 VDC	1200 mA	77 %
TEN 6-2411WIN	TEN 6-2411WIN-HI		5 VDC	1200 mA	80 %
TEN 6-2412WIN	TEN 6-2412WIN-HI		12 VDC	500 mA	84 %
TEN 6-2413WIN	TEN 6-2413WIN-HI		15 VDC	400 mA	84 %
TEN 6-2415WIN	TEN 6-2415WIN-HI		24 VDC	250 mA	84 %
TEN 6-2421WIN	TEN 6-2421WIN-HI		±5 VDC	±500 mA	80 %
TEN 6-2422WIN	TEN 6-2422WIN-HI		±12 VDC	±250 mA	84 %
TEN 6-2423WIN	TEN 6-2423WIN-HI		±15 VDC	±200 mA	84 %
TEN 6-4810WIN	TEN 6-4810WIN-HI	18 – 75 VDC (48 VDC nominal)	3.3 VDC	1200 mA	77 %
TEN 6-4811WIN	TEN 6-4811WIN-HI		5 VDC	1200 mA	80 %
TEN 6-4812WIN	TEN 6-4812WIN-HI		12 VDC	500 mA	84 %
TEN 6-4813WIN	TEN 6-4813WIN-HI		15 VDC	400 mA	84 %
TEN 6-4815WIN	TEN 6-4815WIN-HI		24 VDC	250 mA	84 %
TEN 6-4821WIN	TEN 6-4821WIN-HI		± 5 VDC	±500 mA	80 %
TEN 6-4822WIN	TEN 6-4822WIN-HI		±12 VDC	±250 mA	84 %
TEN 6-4823WIN	TEN 6-4823WIN-HI		±15 VDC	±200 mA	84 %

### Input Specifications

Input current at no load	24 Vin models: 20 mA typ. 48 Vin models: 10 mA typ.
Input current at full load	24 Vin, 3.3VDC models: 215 mA typ. 24 Vin other models: 300 mA typ. 48 Vin, 3.3VDC models: 110 mA typ. 48 Vin other models: 150 mA typ.
Recommended input fuse (slow blow)	24 Vin models: 1500 mA 48 Vin models: 800 mA
Start-up voltage / under voltage shut down	24 Vin models: 9 VDC / 8.5 VDC (or lower) 48 Vin models: 18 VDC / 16 VDC (or lower)
Surge voltage (1 sec. max.)	24 Vin models: 50 V max. 48 Vin models: 100 V max.
Conducted noise	EN 55022 class A

### Output Specifications

Voltage set accuracy	±2 %
Regulation	– Input variation Vin min. to Vin max. 0.5 % max. – Load variation 0 – 100 % single output models: 1.2 % max. dual output models balanced load: 1.2 % max. dual output models 50%/100% unbalanced load: 3.0 % max.
Minimum load	not required
Temperature coefficient	±0.02 %/K
Ripple and noise (20 MHz Bandwidth)	80 mVp-p max.
Dynamic load response (change from 75 % to 100 % load)	±3 % peak variation typ. 300 µS response time typ.
Current limitation	150 % of lout max. typ., constant power
Short circuit protection	continuous, automatic recovery
Capacitive load	3.3 & 5.0 VDC models: 470 µF max. 12 & 15 VDC models: 100 µF max. 24 VDC models: 47 µF max. dual output models: 100 µF max. (each output)

### General Specifications

Temperature ranges	– Operating –40°C to +85°C – Case temperature +100°C max. – Storage –50°C to +125°C
Derating	3.3 & 5.0 VDC models: 2.5 %/K above +60°C other models: 3.3 %/K above +70°C
Humidity (non condensing)	95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)	>800'000 h
Isolation voltage (input/output, 60 sec., functional insulation)	standard models: 1'500 VDC models with suffix -H: 3'000 VDC
Isolation capacitance (input/output, 100 KHz, 1 V)	1000 pF typ.
Isolation resistance (input/output, 500 VDC)	>1'000 M Ohm
Switching frequency	330 kHz typ.

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

**General Specifications**

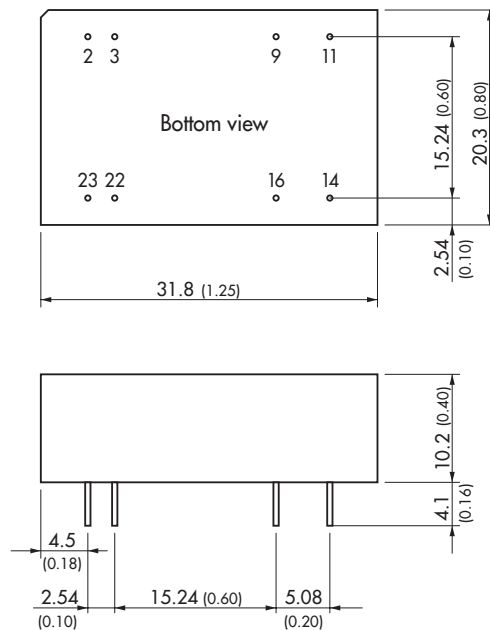
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals	<ul style="list-style-type: none"> <li>- CSA certificate according UL 60950-1</li> <li>- CB test certificate according IEC 60950-1</li> </ul>	<a href="http://www.tracopower.com/products/ten6win-csa.pdf">www.tracopower.com/products/ten6win-csa.pdf</a> <a href="http://www.tracopower.com/products/ten6win-cb.pdf">www.tracopower.com/products/ten6win-cb.pdf</a>
Environmental compliance	<ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>	<a href="http://www.tracopower.com/products/ten6win-reach.pdf">www.tracopower.com/products/ten6win-reach.pdf</a> RoHS directive 2011/65/EU

**Physical Specifications**

Casing material	non conductive plastic (UL 94V-0-rated)
Potting material	epoxy (XM-2109 & XY-2110, UL 94V-0-rated)
Weight	4.8 g (0.16 oz)
Soldering temperature (1.5mm from case for 10 sec.)	max. 260°C

**Application note:** [www.tracopower.com/products/ten6win-application.pdf](http://www.tracopower.com/products/ten6win-application.pdf)

**Outline Dimensions**



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)

Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02  $\pm$  0.002)  
 Tolerances  $\pm 0.25$  ( $\pm 0.01$ )  
 Pin pitch tolerances  $\pm 0.13$  ( $\pm 0.0005$ )

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