



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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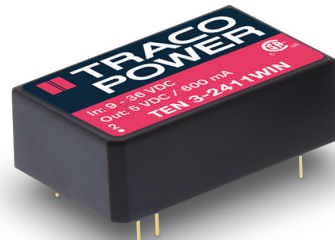
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Features

- ◆ Ultra wide 4 : 1 input range
- ◆ Input filter to meet EN 55032, Class A and FCC, level A without external components
- ◆ Extended operating temperature range -40°C to 85°C
- ◆ Models with 1'500 VDC and 3'000 VDC I/O isolation (functional insulation)
- ◆ DIP-24 package
- ◆ High reliability, MTBF >1.0 Mio. h
- ◆ 3-year product warranty



The TEN 3WIN Series is a drop in replacement of the prevalent TEN 3WI Series. The up-to date design enables a cost reduction without any compromise to reliability and function. They come with an internal filter to meet EN55032 class A without external components. Increased EMC immunity and extended operating temperature range of -40°C to 85°C make these converters an ideal solution for cost critical but demanding applications. With the standard pinning it is a drop in replacement for common 3 Watt converters in DIP24 package.

Models

Ordercode		Input voltage range	Output voltage	Output current max.	Efficiency max.
1500 VDC isolation	3000 VDC isolation				
TEN 3-2410WIN	-	9.0 – 36 VDC (nominal 24 VDC)	3.3 VDC	750 mA	77 %
TEN 3-2411WIN	TEN 3-2411WIN-HI		5.0 VDC	600 mA	79 %
TEN 3-2412WIN	TEN 3-2412WIN-HI		12 VDC	250 mA	82 %
TEN 3-2413WIN	TEN 3-2413WIN-HI		15 VDC	200 mA	83 %
TEN 3-2415WIN	TEN 3-2415WIN-HI		24 VDC	125 mA	81 %
TEN 3-2421WIN	TEN 3-2421WIN-HI		± 5.0 VDC	± 250 mA	80 %
TEN 3-2422WIN	TEN 3-2422WIN-HI		± 12 VDC	± 125 mA	82 %
TEN 3-2423WIN	TEN 3-2423WIN-HI		± 15 VDC	± 100 mA	82 %
TEN 3-4810WIN	-		18 – 75 VDC (nominal 48 VDC)	3.3 VDC	750 mA
TEN 3-4811WIN	TEN 3-4811WIN-HI	5 VDC		600 mA	80 %
TEN 3-4812WIN	TEN 3-4812WIN-HI	12 VDC		250 mA	83 %
TEN 3-4813WIN	TEN 3-4813WIN-HI	15 VDC		200 mA	84 %
TEN 3-4815WIN	TEN 3-4815WIN-HI	24 VDC		125 mA	82 %
TEN 3-4821WIN	TEN 3-4821WIN-HI	± 5.0 VDC		± 250 mA	80 %
TEN 3-4822WIN	TEN 3-4822WIN-HI	± 12 VDC		± 125 mA	82 %
TEN 3-4823WIN	TEN 3-4823WIN-HI	± 15 VDC		± 100 mA	82 %

Input Specifications

Input current no load	24 Vin models 48 Vin models	30 mA typ. 20 mA typ.
Start-up voltage	24 Vin models: 48 Vin models:	9.0 VDC (or lower) 18 VDC (or lower)
Under voltage shut down (lock-out circuit)	24 Vin models: 48 Vin models:	8.5 VDC max. 17.5 VDC max.
Surge voltage (1 s max.)	24 Vin models 48 Vin models	50 V max. 100 V max.
Reflected ripple current	24 Vin models 48 Vin models	15 mA typ 10 mA typ.
EMC emissions		EN 55032 class A (without external components)
EMC immunity	<ul style="list-style-type: none"> - ESD (electrostatic discharge) - Radiated immunity - Fast transient / surge - Conducted immunity 	EN 55024 EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±1 kV, perf. criteria A - External input capacitor 200 µF, 100 V, ESR 48 mOhm EN 61000-4-6, 10 Vrms, perf. criteria A
Short circuit input power		2000 mW max.
Internal power dissipation		1200 mW max.

Output Specifications

Voltage set accuracy		±2 % max.
Regulation	<ul style="list-style-type: none"> - Input variation (Vin min. to Vin max.) - Load variation (0 – 100 %) 	1.0 % max. single output models 1.0 % max. dual output models 2.0 % max. (balanced load)
Minimum load		not required
Ripple and noise (20 MHz bandwidth)		70 mVpk-pk max
Transient response time (25% load step change)		500 µs max.
Transient response deviation (25% load step change)		±5 % max.
Temperature coefficient		±0.02 %/K
Current limitation		>120 % of Iout max., constant current
Short circuit protection		continuous, automatic recovery

Output Specifications (continued)

Capacitive load	3.3 Vout models:	680 μ F max.
	5.0 Vout models:	470 μ F max.
	12 Vout models:	330 μ F max.
	15 Vout models:	220 μ F max.
	24 Vout models:	100 μ F max.
	\pm 5.0 Vout models:	220 μ F max. (each output)
	\pm 12 Vout models:	150 μ F max. (each output)
	\pm 15 Vout models:	100 μ F max. (each output)

General Specifications

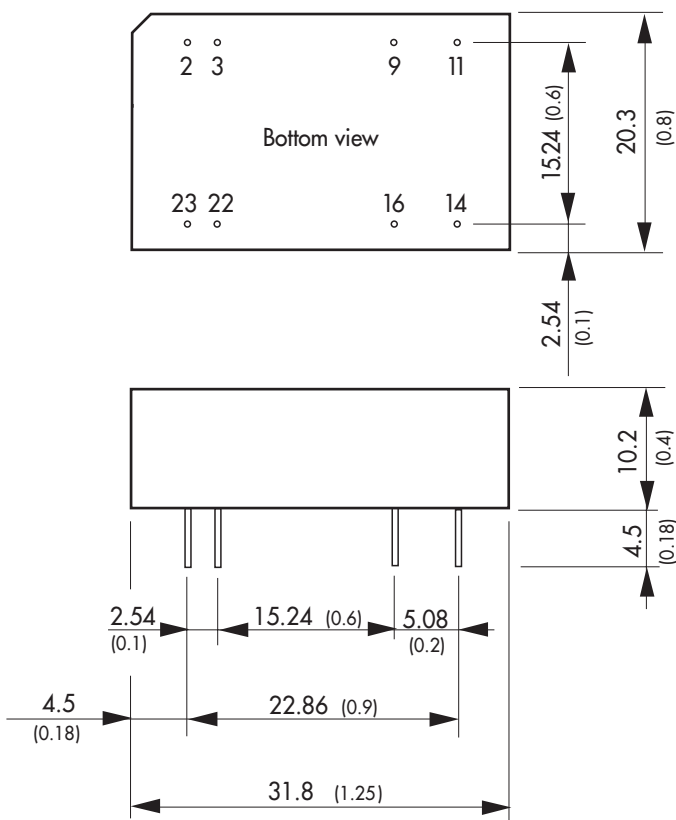
Temperature ranges	- Operating (natural convection cooling 20 LFM)	-40°C to +85°C
	- Case temperature	+100°C max.
	- Storage	-55°C to +125°C
Derating		3.3 %/K above 70°C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 F, at +25°C, ground benign)		>1 Mio. h
Isolation voltage (60 s)	- Input/Output	1'500 VDC or 3'000 VDC
Isolation capacitance	- Input/Output	300 pF max.
Isolation resistance	- Input/Output (500 VDC)	>1'000 M Ohm
Switching frequency		90 kHz min. (pulse frequency modulation PFM)
Safety standards		cUL/UL 60950-1, IEC/EN 60950-1
Safety approvals	- CSA certificate of compliance	CAN/CSA-C22.2 No 60950-1-07, Am 1:2011
	- CB test certificate	ANSI/UL Std No 60950-1, 2nd Ed, AM 1:2011
	- Certification documents	IEC 60950-1:2005 2nd Ed, Am 1:2009 www.tracopower.com/overview/ten3win
Environmental compliance	- Reach	www.tracopower.com/info/reach-declaration.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	non conductive FR4
Potting material	epoxy (UL 94V-0 rated)
Pin material	copper alloy with gold plated subplate
Weight	12.8 g (0.45 oz)
Soldering temperature	260°C / 10 s max.

Outline Dimensions



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

Pin-Out		
Pin	Single	Dual
2	-Vin (GND)	-Vin (GND)
3	-Vin (GND)	-Vin (GND)
9	No pin	Common
11	ntc	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

ntc = not to connect