

- Compact SIP8 plastic case
- Ultra-wide input range: 9 VDC to 75 VDC
- Certification according to IEC/EN/UL 62368-1
- Approved operating temperature from -40°C to +80°C
- I/O isolation 2000 VDC
- Operating up to 5000m altitude
- Short circuit protection and over current limitation
- Under voltage lockout
- Remote ON/OFF
- 3-year product warranty



The TEC 3UI is a series of isolated DC/DC converters with ultra-wide input range. This new converter generation is designed to seamlessly replace and offer an alternative to existing 2:1 and 4:1 input converter series, ensuring no compromise on performance or cost-effectiveness. With an input voltage ranging from 9 to 75 VDC, the TEC 3UI covers a variety of standard bus voltages, minimizing the need for multiple model variants in an application. All models are equipped with short circuit protection, over current limitation, under voltage lockout and feature remote control functions. The converters operate reliably up to a maximum temperature of +90°C, with an approved operating temperature range of -40°C to +80°C according to IEC/EN/UL 62368-1 and can operate at altitudes up to 5000 meters. The compact SIP8 plastic case makes the TEC 3UI series ideal for space-constrained applications. Available as both single and dual output models, these converters are suitable for various industrial applications.

Models						
Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I <sub>max</sub>	Vnom	I <sub>max</sub>	
TEC 3-2410UI	9 - 75 VDC (24 VDC nom.)	3.3 VDC	700 mA			75 %
TEC 3-2411UI		5 VDC	600 mA			79 %
TEC 3-2412UI		12 VDC	250 mA			81 %
TEC 3-2413UI		15 VDC	200 mA			81 %
TEC 3-2421UI		+5 VDC	300 mA	-5 VDC	300 mA	77 %
TEC 3-2422UI		+12 VDC	125 mA	-12 VDC	125 mA	79 %
TEC 3-2423UI		+15 VDC	100 mA	-15 VDC	100 mA	79 %

### Input Specifications

Input Current	- At no load	10 mA max.
	- At full load	185 mA typ. / 400 mA max.
Surge Voltage		100 VDC max. (100 ms max.)
Input Inrush Current		12 A typ.
Under Voltage Lockout		7 VDC min. / 7.5 VDC typ. / 9 VDC max.
Recommended Input Fuse		1'000 mA (slow blow) (3.3 Vout model) 1'500 mA (slow blow) (other models) (The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Capacitor

### Output Specifications

Voltage Set Accuracy		±3% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models: 0.5% max. dual output models: 1% max.
	- Load Variation (0 - 100%)	single output models: 1% max. dual output models: 1.5% max. (Output 1) 1.5% max. (Output 2)
	- Voltage Balance (symmetrical load)	dual output models: 3% max.
	- Cross Regulation (25% / 100% asym. load)	dual output models: 5% max.
Ripple and Noise	- 20 MHz Bandwidth	100 mVp-p max. (w/ 22 µF    22 µF)
Capacitive Load	- single output	3.3 Vout models: 4'400 µF max. 5 Vout models: 2'200 µF max. 12 Vout models: 1'000 µF max. 15 Vout models: 680 µF max.
	- dual output	5 / -5 Vout models: 330 / 330 µF max. 12 / -12 Vout models: 330 / 330 µF max. 15 / -15 Vout models: 220 / 220 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.05 %/K max.
Hold-up Time		1 ms min.
Start-up Time		30 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		200% typ. of Iout max.
Transient Response	- Response Deviation	3% typ. / 5% max. (75% to 100% Load Step)
	- Response Time	500 µs max. (75% to 100% Load Step)

### Safety Specifications

Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents	<a href="http://www.tracopower.com/overview/tec3ui">www.tracopower.com/overview/tec3ui</a>
Pollution Degree		PD 2
Over Voltage Category		Not mains connected

### EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 55032 class A (with external filter) EN 55032 class B (with external filter)
	- Radiated Emissions	EN 55032 class A (with external filter) EN 55032 class B (with external filter)
	External filter proposal:	<a href="http://www.tracopower.com/overview/tec3ui">www.tracopower.com/overview/tec3ui</a>

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

EMS (Immunity)	<ul style="list-style-type: none"> <li>- Electrostatic Discharge</li> <li>- RF Electromagnetic Field</li> <li>- EFT (Burst) / Surge</li> <li>- Conducted RF Disturbances</li> <li>- PF Magnetic Field</li> </ul>	EN 55035 (Multimedia) Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A EN 61000-4-5, $\pm 2$ kV, perf. criteria A Ext. input component: 1500 $\mu$ F / 100 V EN 61000-4-6, 10 Vrms, perf. criteria A Continuous: EN 61000-4-8, 100 A/m, perf. criteria A 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A
EMC / Environmental	- Certification Documents	<a href="http://www.tracopower.com/overview/tec3ui">www.tracopower.com/overview/tec3ui</a>

### General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	<ul style="list-style-type: none"> <li>- Operating Temperature</li> <li>- Approved Ambient Temp.</li> <li>- Case Temperature</li> <li>- Storage Temperature</li> </ul>	-40°C to +90°C +90°C max. (at nominal Vin) +80°C max. (at min. Vin or max. Vin) (for compliance to 62368-1) +110°C max. -55°C to +125°C
Power Derating	- High Temperature	4 %/K above 80°C (average)
		See application note: <a href="http://www.tracopower.com/overview/tec3ui">www.tracopower.com/overview/tec3ui</a>
Cooling System		Natural convection (20 LFM)
Remote Control	<ul style="list-style-type: none"> <li>- Voltage Controlled Remote (passive = on)</li> <li>- Off Idle Input Current</li> <li>- Remote Pin Input Current</li> </ul>	On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 2 mA typ. -0.4 mA max.
Altitude During Operation		5'000 m max.
Regulator Topology		Flyback Converter
Switching Frequency		267 - 444 kHz (PWM) (all models) 300 kHz typ. (PWM) (3.3 Vout model) 400 kHz typ. (PWM) (5/12 Vout models) 270 kHz typ. (PWM) (15 Vout models)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	2'000 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 M $\Omega$ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	50 pF max.
Reliability	- Calculated MTBF	2'400'000 h (MIL-HDBK-217F, ground benign)
Washing Process		Not allowed
Environment	<ul style="list-style-type: none"> <li>- Vibration</li> <li>- Mechanical Shock</li> <li>- Thermal Shock</li> </ul>	MIL-STD-202 10 g, 3 axis, sine sweep, 10-55 Hz, 1 oct/min MIL-STD-202 100 g, 3 axis, half sine, 6 ms, total 18 shocks MIL-STD-202 -55°C to +125°C, 1000 cycles, 30 min each
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Base Material		Non-conductive FR4 (UL 94 V-0 rated)
Isolation Frame Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Phosphor Bronze (C5191)
Pin Foundation Plating		Nickel (0.75 $\mu$ m min.)
Pin Surface Plating		Tin (120 $\mu$ m min.), bright
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		SIP8

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

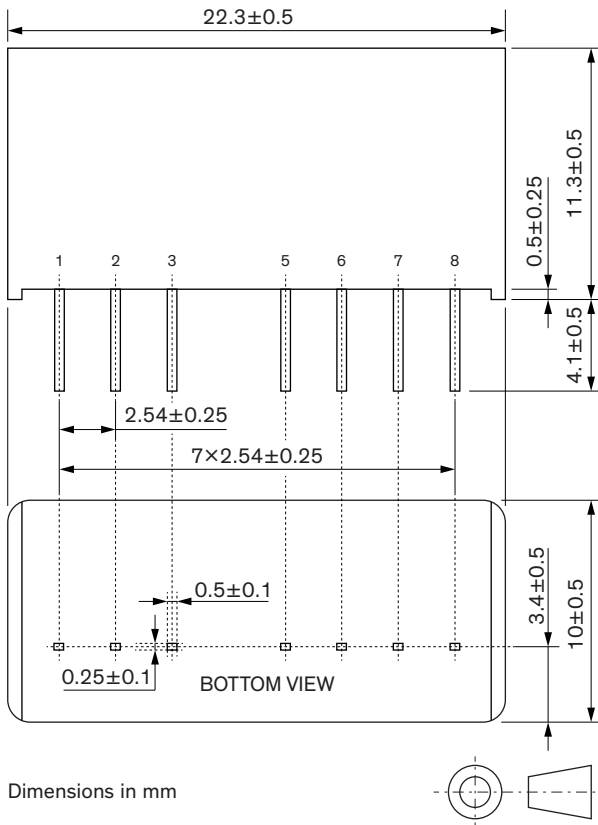
Soldering Profile	Lead-Free Wave Soldering 260°C / 5 s max.
Weight	4.5 g
Thermal Impedance - Case to Ambient	45.2 K/W typ.
Environmental Compliance - REACH Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant
- RoHS Declaration	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7a, 7c-1 (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))
- SCIP Reference Number	8e8d0849-d454-4473-8918-bb276d036424

### Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tec3ui](http://www.tracopower.com/overview/tec3ui)

### Outline Dimensions



Pinout		
Pin	Single	Dual
1	-Vin	
2	+Vin	
3	Remote On/Off	
5	NC	
6	+Vout	
7	-Vout	Common
8	NC	-Vout

NC: Not connected