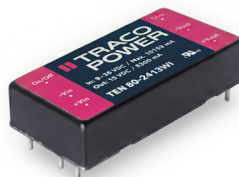


- 2" x 1" metal package
- Wide 4:1 input voltage range
9–36, 18–75 VDC
- Minimal heat development due to high efficiencies up to 92%
- Remote On/Off and Trim function
- Operating temperature range
–40°C to +85°C
- EN 55032 class A (with external components)
- Protection against short circuit, overvoltage and overtemperature
- Under voltage lockout
- 3-year product warranty



The TEN 80WI series is a family of high performance 80 Watt DC/DC converter modules featuring ultra wide 4:1 input voltage ranges in a six side shielded 2" x 1" metal package with industry standard footprint. High efficiencies of up to 92% allow for an operating temperature range (natural convection) of –40 to +70°C without power derating (model dependent, with heatsink). Certified according to the latest IT standard (IEC/EN/UL 62368-1) and equipped with additional features like remote on/off function and protection against short circuit, overvoltage and over temperature the TEN 80WI series is suitable for many industrial applications.

Models						
Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I _{max}	Vnom	I _{max}	
TEN 80-2412WI	9 - 36 VDC (24 VDC nom.)	12 VDC	6'600 mA			92 %
TEN 80-2413WI		15 VDC	5'300 mA			92 %
TEN 80-2415WI		24 VDC	3'300 mA			92 %
TEN 80-2422WI		+12 VDC	3'300 mA	–12 VDC	3'300 mA	92 %
TEN 80-2423WI		+15 VDC	2'660 mA	–15 VDC	2'660 mA	92 %
TEN 80-4812WI	18 - 75 VDC (48 VDC nom.)	12 VDC	6'600 mA			92 %
TEN 80-4813WI		15 VDC	5'300 mA			92 %
TEN 80-4815WI		24 VDC	3'300 mA			92 %
TEN 80-4822WI		+12 VDC	3'300 mA	–12 VDC	3'300 mA	92 %
TEN 80-4823WI		+15 VDC	2'660 mA	–15 VDC	2'660 mA	92 %

➔ Available soon: Models with 5 Vout and 48 Vout

Options	
TEN-HS11	- Optional Heat Sink: www.tracopower.com/overview/ten-hs11
on demand (backorder with MOQ non stocking item)	- Optional model with 54 VDC and 1'480 mA Output, and 9 - 36 VDC Input - Optional model with 54 VDC and 1'480 mA Output, and 18 - 75 VDC Input - Optional models with inverse Remote On/Off function (passive = off) - Optional models with pre-assembled heatsink

Input Specifications

Input Current	- At no load	24 Vin models: 45 mA typ. / 50 mA max. 48 Vin models: 35 mA typ. / 40 mA max.
	- At full load	24 Vin models: 3'611 mA typ. / 3'704 mA max. 48 Vin models: 1'805 mA typ. / 1'852 mA max.
Surge Voltage		24 Vin models: 50 VDC max. (100 ms max.) 48 Vin models: 100 VDC max. (100 ms max.)
Start-up Voltage		24 Vin models: 8.3 VDC min. / 8.6 VDC typ. / 9 VDC max. 48 Vin models: 17.1 VDC min. / 17.5 VDC typ. / 18 VDC max.
Under Voltage Lockout		24 Vin models: 7.5 VDC min. / 7.8 VDC typ. / 8.1 VDC max. 48 Vin models: 15 VDC min. / 16 VDC typ. / 17 VDC max.
Recommended Input Fuse		24 Vin models: 16'000 mA (slow blow) 48 Vin models: 8'000 mA (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Capacitor

Output Specifications

Output Voltage Adjustment		-15% to +5% (54 Vout models) ±10% (other models) (single output models only) (By external trim resistor) See application note: www.tracopower.com/ten80wi-adj/ Output power must not exceed rated power!
Voltage Set Accuracy		±1% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models: 0.2% max. dual output models: 0.2% max.
	- Load Variation (0 - 100%)	single output models: 0.3% max. dual output models: 0.3% max. (Output 1) 0.3% max. (Output 2)
	- Voltage Balance (symmetrical load)	dual output models: 2% max.
	- Cross Regulation (25% / 100% asym. load)	dual output models: 5% max.
Ripple and Noise (20 MHz Bandwidth)	- single output	12 Vout models: 125 mVp-p max. (w/ 22 µF MLCC) 15 Vout models: 125 mVp-p max. (w/ 22 µF MLCC) 24 Vout models: 200 mVp-p max. (w/ 22 µF MLCC) 54 Vout models: 330 mVp-p max. (w/ 22 µF MLCC)
	- dual output	12 / -12 Vout models: 125 / 125 mVp-p max. (w/ 22 µF MLCC) 15 / -15 Vout models: 125 / 125 mVp-p max. (w/ 22 µF MLCC)
	- single output	12 Vout models: 100 mVp-p typ. (w/ 22 µF MLCC) 15 Vout models: 100 mVp-p typ. (w/ 22 µF MLCC) 24 Vout models: 150 mVp-p typ. (w/ 22 µF MLCC) 54 Vout models: 280 mVp-p typ. (w/ 22 µF MLCC)
	- dual output	12 / -12 Vout models: 100 / 100 mVp-p typ. (w/ 22 µF MLCC) 15 / -15 Vout models: 100 / 100 mVp-p typ. (w/ 22 µF MLCC)
Capacitive Load	- single output	12 Vout models: 4'950 µF max. 15 Vout models: 3'150 µF max. 24 Vout models: 1'250 µF max. 54 Vout models: 250 µF max.
	- dual output	12 / -12 Vout models: 2'500 / 2'500 µF max. 15 / -15 Vout models: 1'600 / 1'600 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Hold-up Time		1 ms min. (24 Vin models) 6 ms min. (48 Vin models)
Start-up Time		35 ms typ. / 50 ms max.

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

Start-up Overshoot Voltage	5% max.
Short Circuit Protection	Continuous, Automatic recovery
Overload Protection	Switch off after 4 s delay, automatic restart
Output Current Limitation	110 - 160% of I _{out} max. 135% typ. of I _{out} max.
Overvoltage Protection	112 - 122% of V _{out} nom. 117% typ. of V _{out} nom.
Transient Response	- Response Deviation - Response Time
	3% typ. / 5% max. (25% Load Step) 300 µs typ. / 500 µs max. (25% Load Step)

Safety Specifications

Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents	www.tracopower.com/ten80wi-safety-cert/
Pollution Degree		PD 3
Over Voltage Category		Not mains connected

EMC Specifications

EMI (Emissions)	- Conducted Emissions - Radiated Emissions	EN 55032 class A (with external filter) EN 55032 class A (with external filter)
	External filter proposal:	www.tracopower.com/ten80wi-emc-filter/
EMS (Immunity)	- Electrostatic Discharge - RF Electromagnetic Field - EFT (Burst) / Surge	EN 55035 (Multimedia) Air: EN 61000-4-2, ±8 kV, perf. criteria A Contact: EN 61000-4-2, ±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, ±2 kV, perf. criteria A
	Ext. input component:	2x 1200µF / 50V / CHEMI-CON KY (24 Vin) 2x 470µF / 100V / CHEMI-CON KY (48 Vin)
	- Conducted RF Disturbances - PF Magnetic Field	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	www.tracopower.com/ten80wi-emc-cert/

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +75°C -40°C to +83°C (with heatsink TEN-HS11) +105°C max.
	- Case Temperature - Storage Temperature	-50°C to +125°C
Power Derating	- High Temperature	2.22 %/K above 60°C (average) 2.86 %/K above 70°C (average) (with heatsink TEN-HS11)
	See application note:	www.tracopower.com/ten80wi-cc/
Over Temperature Protection Switch Off	- Protection Mode - Measurement Point	106°C min. / 110°C typ. / 115°C max. (Automatic recovery at 95°C typ.) Base-Plate
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on) - Off Idle Input Current - Remote Pin Input Current	On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 4 mA typ. / 8 mA max. -0.5 to 0.5 mA
Altitude During Operation		5'000 m max.

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

Regulator Topology	Flyback Converter, QR Flyback Converter
Switching Frequency	150 - 500 kHz (PWM, PWM QR) 200 kHz typ. (PWM, PWM QR)
Insulation System	Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s - Input to Output, 1 s - Output to Case, 60 s
Creepage	- Input to Output
Clearance	- Input to Output
Isolation Resistance	- Input to Output, 500 VDC
Isolation Capacitance	- Input to Output, 100 kHz, 1 V
Reliability	- Calculated MTBF
Washing Process	According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Environment	- Vibration - Mechanical Shock - Thermal Shock
Housing Material	Copper
Base Material	Non-conductive FR4 (UL 94 V-0 rated)
Potting Material	Silicone (UL 94 V-0 rated)
Pin Material	Copper
Pin Foundation Plating	Nickel (2 - 4 µm)
Pin Surface Plating	Tin (3 - 5 µm), matte
Housing Type	Metal Case
Mounting Type	PCB Mount
Connection Type	THD (Through-Hole Device)
Footprint Type	2" x 1"
Soldering Profile	Lead-Free Wave Soldering 260°C / 10 s max.
Weight	46 g (standard models) 76 g (models with pre-assembled heatsink)
Thermal Impedance	- Case to Ambient
Environmental Compliance	- REACH Declaration - RoHS Declaration - SCIP Reference Number

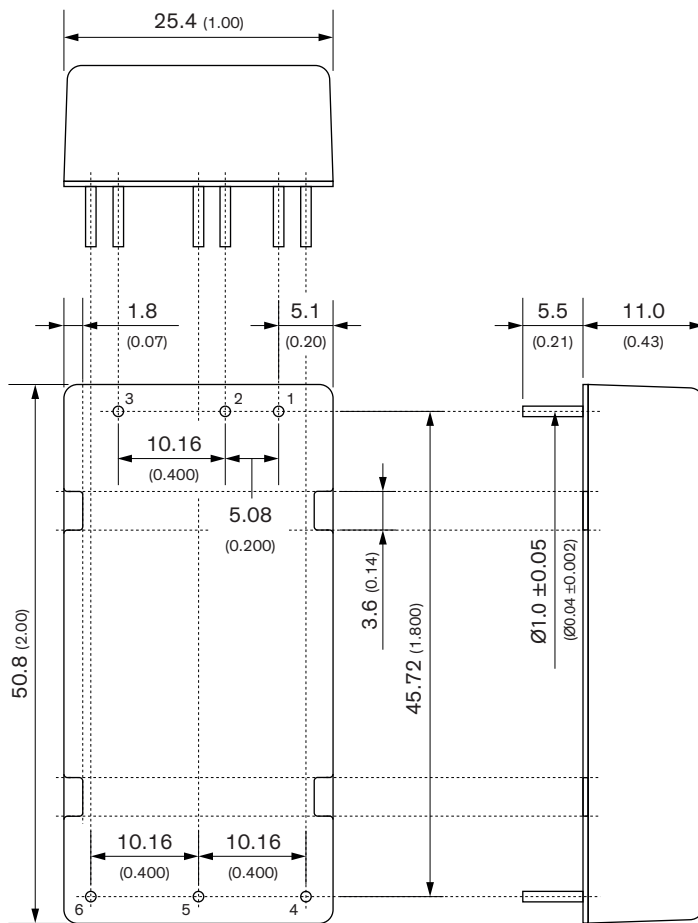
Additional Information

Supporting Documents	www.tracopower.com/overview/ten80wi
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf
Service Portal	www.tracoserviceportal.com

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

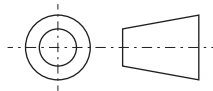
Outline Dimensions

Standard model



Dimensions in mm (inch)

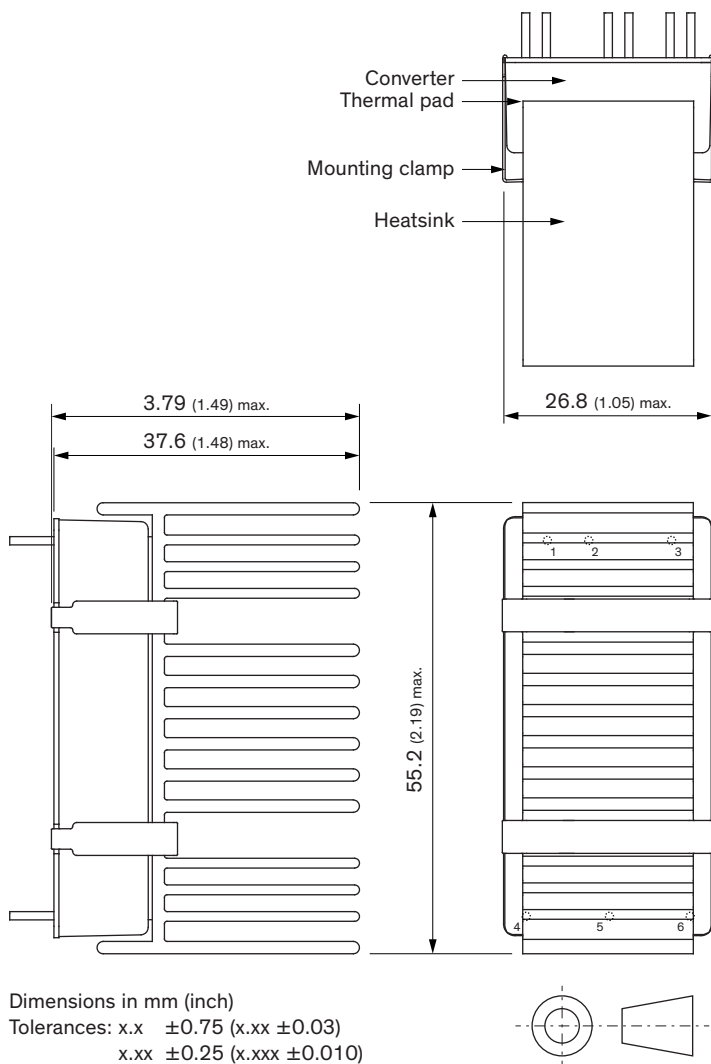
Tolerances: x.x ± 0.75 (x.xx ± 0.03)
 x.xx ± 0.25 (x.xxx ± 0.010)



Pinout		
Pin	Single	Dual
1	+Vin	
2	-Vin	
3	Remote On/Off	
4	+Vout	
5	-Vout	Common
6	Trim	-Vout

Avoid routing PCB traces under the converter.

Optional model with pre-assembled heatsink



Pinout		
Pin	Single	Dual
1	+Vin	
2	-Vin	
3	Remote On/Off	
4	+Vout	
5	-Vout	Common
6	Trim	-Vout

Avoid routing PCB traces under the converter.