

### Features

- ◆ Smallest 15W converter  
ultra compact size: 27.9 x 23.9 x 8.5mm
- ◆ Ultra wide 4:1 input voltage range
- ◆ Cost efficient open frame design with industry standard pin-out
- ◆ Surface-mount (SM) and through-hole version
- ◆ I/O isolation voltage 2250V, rated for basic insulation
- ◆ Extended operating temperature range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- ◆ Input filter meets EN55022, Class A
- ◆ Under voltage lockout
- ◆ Remote On/Off
- ◆ Lead free design, RoHS compliant
- ◆ 3-years product warranty



The TON-15WI series is a new generation of high performance 15W dc-dc converters with ultra-wide input voltage range and precisely regulated output voltage. The ultra compact open frame design with industry standard pin-out provides the designer now a 50% smaller, cost efficient alternative to existing 10 to 15W converters in the market. Built-in filters for both input and output minimize the need for external filtering.

Further features include remote On/Off, output voltage trimming, over voltage protection, under voltage lockout and short circuit protection. Typical applications are distributed power systems, instrumentation and industrial electronics, everywhere where space on the PCB is a critical factor.

### Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TON 15-2410WI	<b>9 – 36 VDC</b> (24 VDC nominal)	3.3 VDC	4'000 mA	84 %
TON 15-2411WI		5.0 VDC	3'000 mA	84 %
TON 15-2412WI		12 VDC	1'300 mA	85 %
TON 15-2413WI		15 VDC	1'000 mA	86 %
TON 15-4810WI	<b>18 – 75 VDC</b> (48 VDC nominal)	3.3 VDC	4'000 mA	86 %
TON 15-4811WI		5.0 VDC	3'000 mA	86 %
TON 15-4812WI		12 VDC	1'300 mA	87 %
TON 15-4813WI		15 VDC	1'000 mA	88 %

Add suffix **SM** for surface mount version

### Input Specifications

Input current at no load	24 V; 3.3/5 Vout models: 50 mA typ. 24 V; 12/15 Vout models: 20 mA typ. 48 V; 3.3/5 Vout models: 40 mA typ. 48 V; 12/15 Vout models: 15 mA typ.
Input current at full load	24 V; 3.3 Vout models: 690 mA typ. 24 V; other output models: 800 mA typ. 48 V; 3.3 Vout models: 340 mA typ. 48 V; other output models: 390 mA typ.
Input voltage variation (dv/dt)	5 V/ms, max. (complies with ETS 300 132 part. 4.4)
Start-up voltage / Under voltage lockout	24 V models: 9 VDC / 8 VDC (typ.) 48 V models: 18 VDC / 16 VDC (typ.)
Surge voltage (100 msec. max.)	24 V models: 50 V max. 48 V models: 100 V max.
Conducted input noise (no ext. components)	EN 55022 level A, FCC part 15, level A

### Output Specifications

Voltage set accuracy	±1 %
Output voltage adjustment	±10 %
Regulation	– Input variation Vin min. to Vin max: 0.2 % max. – Load variation 0 – 100 %: 0.2 % max.
Temperature coefficient	±0.02 %/K
Ripple and noise (20 MHz Bandwidth) with a 1µF M/C and a 10µF T/C, see note 1	3.3 / 5 Vout models: 75 mVpk-pk max. 12 / 15 Vout models: 100 mVpk-pk max.
Start up time (nominal Vin and constant resistive load)	30 ms typ.
Transient response settling time (25% load step chang)	250 µs typ.
Short circuit protection	indefinite (automatic recovery)
Over load protection	<150 % of Iout max., foldback
Over voltage protection	3.3 Vout models: 3.7 – 5.4 Vout 5 Vout models: 5.6 – 7.0 Vout 12 Vout models: 13.5 – 19.6 Vout 15 Vout models: 16.8 – 20.5 Vout
Capacitive load	3.3 Vout & 5.0 Vout models: 1'000 µF max. 12 Vout models: 330 µF max. 15 Vout models: 220 µF max.

### General Specifications

Temperature ranges	– Operating: –40°C to +85°C – Storage: –55°C to +125°C
Derating	2.0 %/K above 60°C
Humidity (non condensing)	95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at 25°C, ground benign)	>500'000 h
Isolation voltage (60 sec) – Input / Output	2'250 VDC (complies with basic insulation rating per EN 60950-1)
Isolation resistance – Input / Output	>1'000 M Ohm
Isolation capacity – Input / Output	1000 pF max.
Switching frequency (Pulse width modulation PWM)	3.3 / 5 Vout models: 350 kHz typ. 12 / 15 Vout models: 400 kHz typ.

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

**General Specifications**

Remote On/Off	- On: - Off: - Off idle current:	3.0 ... 15 VDC or open circuit. 0 ... 1.2 VDC or short circuit pin 6 and pin 2 2.5 mA typ.
Vibration		10-55 Hz, 2G, 30 minutes along X,Y,Z
Safety standards		UL 60950-1, EN 60950-1, IEC 60950-1
Safety approvals		UL/cUL File E188913

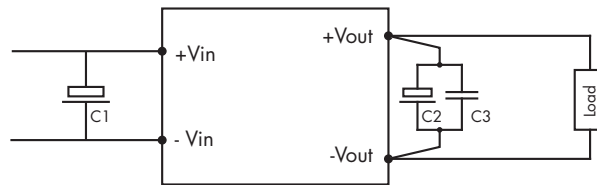
**Physical Specifications**

Weight		10.5g (0.36 oz)
Soldering profile	- Trough hole version - SMD version	max. 265 °C / 10 sec. (wave soldering) lead-free reflow solder process as per IPC/JEDEC J-STD-020D peak temp. 245°C (20 sec. max.)

**Output Voltage Adjustment**



**Note 1** Recommended circuit to reduce conducted noise and output ripple & noise:

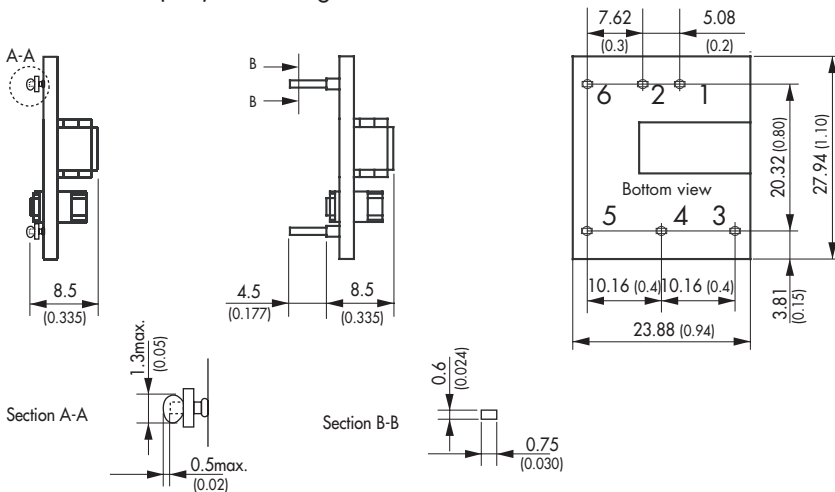


C1: 33µF low ESR electrolytic capacitor  
C2: 10µF low ESR electrolytic capacitor  
C3: 1µ film capacitor

Application notes can be downloaded under : [www.tracopower.com/products/ton15wi\\_application.pdf](http://www.tracopower.com/products/ton15wi_application.pdf)

**Outline Dimensions**

SMD Version (SM)      Trough Hole Version



Pin-Out	
Pin	Single
1	+Vin (Vcc)
2	-Vin (GND)
3	+Vout
4	Trim
5	-Vout
6	Remote On/Off

Dimensions in [mm], ( ) = Inch  
Tolerances ±0.35 (±0.014)

Specifications can be changed any time without notice.