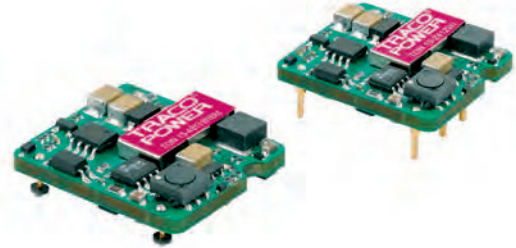


Features

- ◆ Ultra compact 15W converter
- ◆ 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°C to $+85^{\circ}\text{C}$
- ◆ Remote On/Off
- ◆ Lead free design, RoHS compliant
- ◆ 3-years product warranty



The TON-15WI series is a 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 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 | 9 – 36 VDC (24 VDC nominal) | 3.3 VDC | 4'000 mA | 85 % |
| TON 15-2411WI | | 5.0 VDC | 3'000 mA | 87 % |
| TON 15-2412WI | | 12 VDC | 1'300 mA | 86 % |
| TON 15-2413WI | | 15 VDC | 1'000 mA | 86 % |
| TON 15-4810WI | 18 – 75 VDC (48 VDC nominal) | 3.3 VDC | 4'000 mA | 85 % |
| TON 15-4811WI | | 5.0 VDC | 3'000 mA | 87 % |
| TON 15-4812WI | | 12 VDC | 1'300 mA | 86 % |
| TON 15-4813WI | | 15 VDC | 1'000 mA | 86 % |

Add suffix **SM** for surface mount version

Input Specifications

| | | |
|--|--|--|
| Input current at no load | 24 V; 3.3/5 Vout models: 24 V; 12/15 Vout models: 48 V; 3.3/5 Vout models: 48 V; 12/15 Vout models: | 65 mA typ. 10 mA typ. 40 mA typ. 15 mA typ. |
| Input current at full load | 24 V; 3.3 Vout models: 24 V; other output models: 48 V; 3.3 Vout models: 48 V; other output models: | 680 mA typ. 790 mA typ. 340 mA typ. 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: 48 V models: | 9 VDC / 8 VDC 18 VDC / 16 VDC |
| Surge voltage (100 msec. max.) | 24 V models: 48 V models: | 50 V max. 100 V max. |
| Input filter | | capacitor type (see application note for compliance to EN 55022 class A/B) |
| Radiated immunity | | EN 61000-4-3 10 V/m, perf. criteriy A |
| Fast transient / surge | | EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±1 kV perf. criteria A with external input capacitor e.g. Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm |
| Conducted immunity | | EN 61000-4-6, 3 Vrms, perf. criteria A |
| Reflected ripple current | | 30 mA _{p-p} typ. |

Output Specifications

| | | |
|--|--|--|
| Voltage set accuracy | | ±1 % |
| Output voltage adjustment | | ±10 % (see application note) |
| Regulation | – Input variation Vin min. to Vin max. – Load variation 0 – 100 % | 0.2 % max. 0.2 % max. |
| Minimum load | | 0 % of rated max. load |
| Temperature coefficient | | ±0.02 %/K |
| Ripple and noise (20 MHz Bandwidth, measured with 1 µF M/C and 10 µF TC) | | 100 mV _{pk-pk} typ |
| Start up time | – Power On (constant resistive load) – Remote On | 30 ms typ. 30 ms typ. |
| Transient response setting time (25% load step chang) | | 250 µs typ. |
| Short circuit protection | | indefinite (automatic recovery) |
| Over load protection | | at 150 % of Iout max., foldback |
| Over voltage protection | 3.3 Vout models: 5 Vout models: 12 Vout models: 15 Vout models: | 3.7 – 5.4 Vout 5.6 – 7.0 Vout 13.8 – 17.5 Vout 16.8 – 20.5 Vout |
| Capacitive load | 3.3 Vout & 5.0 Vout models: 12 Vout models: 15 Vout models: | 1'000 µF max. 330 µF max. 220 µF max. |

General Specifications

| | | |
|---------------------------|--------------------------|---|
| Temperature ranges | – Operating – Storage | –40°C to +85°C (with derating) –55°C to +125°C |
| Derating | | 6.7 %/K above 75°C |
| Humidity (non condensing) | | 5 % to 95 % rel H |

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

General Specifications

| | | |
|---|--|---|
| Thermal shock | | acc. MIL-STD-810F |
| Vibration | | acc. MIL-STD-810F |
| Reliability, calculated MTBF (MIL-HDBK-217F, at 25°C., ground benign) | | >2.4 Mio. 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 capacitance – Input / Output | | 1500 pF max. |
| Switching frequency (Pulse width modulation PWM) | 3.3 / 5 Vout models: 12 / 15 Vout models: | 350 kHz typ. 400 kHz typ. |
| Remote On/Off – On: – Off: – Off idle current: | | 3.0 to 15 VDC or open circuit. 0 to 1.2 VDC or short circuit pin 6 and pin 2 2.5 mA typ. negative remote On/Off logic on demand |
| Safety standards | | UL 60950-1, EN 60950-1, IEC 60950-1 |
| Safety approval | | www.ul.com -> certifications -> File e188913 |
| Environmental compliance – Reach – RoHS | | www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU |

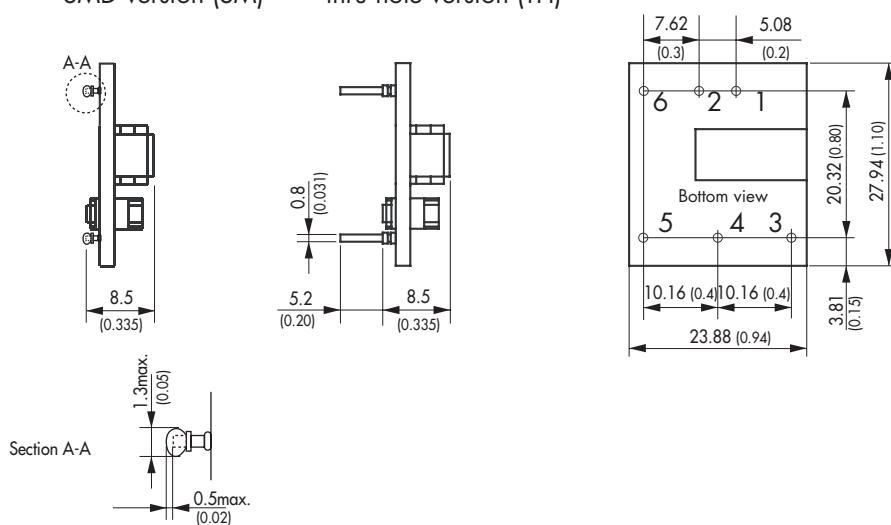
Physical Specifications

| | | |
|--|--|---|
| Weight | | 10.5g (0.36oz) |
| Soldering profile for trough hole version | | max. 265°C / 10 sec. (wave soldering) |
| Lead-free reflow solder process for SMD-package models | | as per J-STD-020D.01 (to find at: www.jedec.org - free registration required) |
| Washing procedure | | www.tracopower.com/products/ton15-clean.pdf |

Application note: www.tracopower.com/products/ton15wi-application.pdf

Outline Dimensions

SMD version (SM) thru hole version (TH)



| 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: ±0.5 (±0.02)
Pin pitch tolerances: ±0.25 (±0.01)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com

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