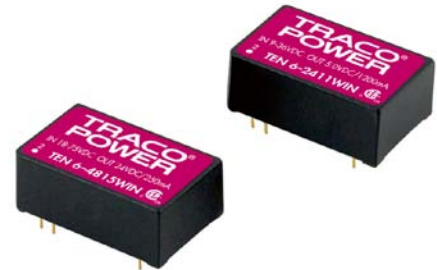


Features

- ◆ Wide 4:1 input voltage range
- ◆ High efficiency
- ◆ Operating temperature range
-40°C to +85°C
- ◆ No minimum load required
- ◆ Models with 1'500 VDC and 3'000 VDC
I/O-isolation (functional insulation)
- ◆ Input filter meets EN 55022, class A
- ◆ Overload protection
- ◆ DIP-24 plastic package
- ◆ Industry standard pinout
- ◆ 3-year product warranty



The TEN-6WIN series is designed for an optimized cost/performance ratio of DC/DC converters with output power of 6 Watt.

General features like no minimum load requirement, overload protection, internal filter for EN55022 class A and high efficiency make these converters easy to design in. With the popular DIP-24 standard package they are also a drop in replacement for many cost critical applications.

Models

| Order code | | Input voltage range | Output voltage | Output current max. | Efficiency typ. |
|---------------------|---------------------|---------------------------------|----------------|---------------------|-----------------|
| 1'500 VDC isolation | 3'000 VDC isolation | | | | |
| TEN 6-2410WIN | TEN 6-2410WIN-HI | 9 – 36 VDC (24 VDC nominal) | 3.3 VDC | 1200 mA | 77 % |
| TEN 6-2411WIN | TEN 6-2411WIN-HI | | 5 VDC | 1200 mA | 80 % |
| TEN 6-2412WIN | TEN 6-2412WIN-HI | | 12 VDC | 500 mA | 84 % |
| TEN 6-2413WIN | TEN 6-2413WIN-HI | | 15 VDC | 400 mA | 84 % |
| TEN 6-2415WIN | TEN 6-2415WIN-HI | | 24 VDC | 250 mA | 84 % |
| TEN 6-2421WIN | TEN 6-2421WIN-HI | | ±5 VDC | ±500 mA | 80 % |
| TEN 6-2422WIN | TEN 6-2422WIN-HI | | ±12 VDC | ±250 mA | 84 % |
| TEN 6-2423WIN | TEN 6-2423WIN-HI | | ±15 VDC | ±200 mA | 84 % |
| TEN 6-4810WIN | TEN 6-4810WIN-HI | 18 – 75 VDC (48 VDC nominal) | 3.3 VDC | 1200 mA | 77 % |
| TEN 6-4811WIN | TEN 6-4811WIN-HI | | 5 VDC | 1200 mA | 80 % |
| TEN 6-4812WIN | TEN 6-4812WIN-HI | | 12 VDC | 500 mA | 84 % |
| TEN 6-4813WIN | TEN 6-4813WIN-HI | | 15 VDC | 400 mA | 84 % |
| TEN 6-4815WIN | TEN 6-4815WIN-HI | | 24 VDC | 250 mA | 84 % |
| TEN 6-4821WIN | TEN 6-4821WIN-HI | | ± 5 VDC | ±500 mA | 80 % |
| TEN 6-4822WIN | TEN 6-4822WIN-HI | | ±12 VDC | ±250 mA | 84 % |
| TEN 6-4823WIN | TEN 6-4823WIN-HI | | ±15 VDC | ±200 mA | 84 % |

Input Specifications

| | |
|--|--|
| Input current at no load | 24 Vin models: 20 mA typ. 48 Vin models: 10 mA typ. |
| Input current at full load | 24 Vin, 3.3VDC models: 215 mA typ. 24 Vin other models: 300 mA typ. 48 Vin, 3.3VDC models: 110 mA typ. 48 Vin other models: 150 mA typ. |
| Recommended input fuse (slow blow) | 24 Vin models: 1500 mA 48 Vin models: 800 mA |
| Start-up voltage / under voltage shut down | 24 Vin models: 9 VDC / 8.5 VDC (or lower) 48 Vin models: 18 VDC / 16 VDC (or lower) |
| Surge voltage (1 sec. max.) | 24 Vin models: 50 V max. 48 Vin models: 100 V max. |
| Conducted noise | EN 55022 class A |

Output Specifications

| | |
|--|---|
| Voltage set accuracy | ±2 % |
| Regulation | – Input variation Vin min. to Vin max. 0.5 % max. – Load variation 0 – 100 % single output models: 1.2 % max. dual output models balanced load: 1.2 % max. dual output models 50%/100% unbalanced load: 3.0 % max. |
| Minimum load | not required |
| Temperature coefficient | ±0.02 %/K |
| Ripple and noise (20 MHz Bandwidth) | 80 mVp-p max. |
| Dynamic load response (change from 75 % to 100 % load) | ±3 % peak variation typ. 300 µS response time typ. |
| Current limitation | 150 % of lout max. typ., constant power |
| Short circuit protection | continuous, automatic recovery |
| Capacitive load | 3.3 & 5.0 VDC models: 470 µF max. 12 & 15 VDC models: 100 µF max. 24 VDC models: 47 µF max. dual output models: 100 µF max. (each output) |

General Specifications

| | |
|---|---|
| Temperature ranges | – Operating –40°C to +85°C – Case temperature +100°C max. – Storage –50°C to +125°C |
| Derating | 3.3 & 5.0 VDC models: 2.5 %/K above +60°C other models: 3.3 %/K above +70°C |
| Humidity (non condensing) | 95 % rel H max. |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | >800'000 h |
| Isolation voltage (input/output, 60 sec., functional insulation) | standard models: 1'500 VDC models with suffix -H: 3'000 VDC |
| Isolation capacitance (input/output, 100 KHz, 1 V) | 1000 pF typ. |
| Isolation resistance (input/output, 500 VDC) | >1'000 M Ohm |
| Switching frequency | 330 kHz typ. |

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

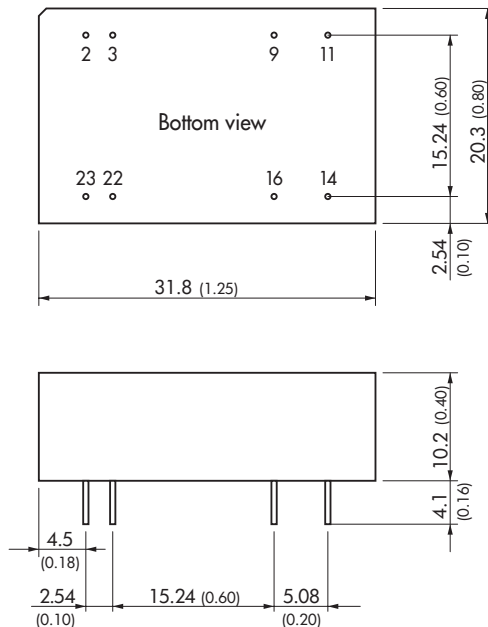
General Specifications

| | | |
|--------------------------|---|--|
| Safety standards | | UL/cUL 60950-1, IEC/EN 60950-1 |
| Safety approvals | <ul style="list-style-type: none"> - CSA certificate according UL 60950-1 - CB test certificate according IEC 60950-1 | www.tracopower.com/products/ten6win-csa.pdf www.tracopower.com/products/ten6win-cb.pdf |
| Environmental compliance | <ul style="list-style-type: none"> - Reach - RoHS | www.tracopower.com/products/ten6win-reach.pdf RoHS directive 2002/95/EC |

Physical Specifications

| | |
|---|---|
| Casing material | non conductive plastic (UL 94V-0-rated) |
| Potting material | epoxy (XM-2109 & XY-2110, UL 94V-0-rated) |
| Weight | 4.8 g (0.16 oz) |
| Soldering temperature (1.5mm from case for 10 sec.) | max. 260°C |

Outline Dimensions



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

Dimensions in [mm], () = Inch
 Pin diameter $\varnothing 0.5 \pm 0.05$ (0.02 ± 0.002)
 Tolerances ± 0.25 (± 0.01)
 Pin pitch tolerances ± 0.13 (± 0.0005)

Specifications can be changed any time without notice.

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