

Features

- ◆ Ultra wide 4 : 1 input range
- ◆ Input filter to meet EN 55022, Class A and FCC, level A without external components
- ◆ Extended operating temperature range -40°C to 85°C
- ◆ Models with 1'500 VDC and 3'000 VDC I/O isolation (functional insulation)
- ◆ DIP-24 package
- ◆ High reliability, MTBF >1.0 Mio. h
- ◆ 3-year product warranty



The TEN 3WIN Series is a drop in replacement of the prevalent TEN 3WI Series. The up-to date design enables a cost reduction without any compromise to reliability and function. They come with an internal filter to meet EN55022 class A without external components. Increased EMC immunity and extended operating temperature range of -40°C to 85°C make these converters an ideal solution for cost critical but demanding applications. With the standard pinning it is a drop in replacement for common 3 Watt converters in DIP24 package.

Models

| Ordercode | | Input voltage range | Output voltage | Output current max. | Efficiency max. |
|--------------------|--------------------|----------------------------------|---------------------------------|---------------------|-----------------|
| 1500 VDC isolation | 3000 VDC isolation | | | | |
| TEN 3-2410WIN | - | 9.0 – 36 VDC (nominal 24 VDC) | 3.3 VDC | 750 mA | 77 % |
| TEN 3-2411WIN | TEN 3-2411WIN-HI | | 5.0 VDC | 600 mA | 79 % |
| TEN 3-2412WIN | TEN 3-2412WIN-HI | | 12 VDC | 250 mA | 82 % |
| TEN 3-2413WIN | TEN 3-2413WIN-HI | | 15 VDC | 200 mA | 83 % |
| TEN 3-2415WIN | TEN 3-2415WIN-HI | | 24 VDC | 125 mA | 81 % |
| TEN 3-2421WIN | TEN 3-2421WIN-HI | | ± 5.0 VDC | ± 250 mA | 80 % |
| TEN 3-2422WIN | TEN 3-2422WIN-HI | | ± 12 VDC | ± 125 mA | 82 % |
| TEN 3-2423WIN | TEN 3-2423WIN-HI | | ± 15 VDC | ± 100 mA | 82 % |
| TEN 3-4810WIN | - | | 18 – 75 VDC (nominal 48 VDC) | 3.3 VDC | 750 mA |
| TEN 3-4811WIN | TEN 3-4811WIN-HI | 5 VDC | | 600 mA | 80 % |
| TEN 3-4812WIN | TEN 3-4812WIN-HI | 12 VDC | | 250 mA | 83 % |
| TEN 3-4813WIN | TEN 3-4813WIN-HI | 15 VDC | | 200 mA | 84 % |
| TEN 3-4815WIN | TEN 3-4815WIN-HI | 24 VDC | | 125 mA | 82 % |
| TEN 3-4821WIN | TEN 3-4821WIN-HI | ± 5.0 VDC | | ± 250 mA | 80 % |
| TEN 3-4822WIN | TEN 3-4822WIN-HI | ± 12 VDC | | ± 125 mA | 82 % |
| TEN 3-4823WIN | TEN 3-4823WIN-HI | ± 15 VDC | | ± 100 mA | 82 % |

Input Specifications

| | | |
|--|--|---|
| Input current no load | 24 Vin models 48 Vin models | 30 mA typ. 20 mA typ. |
| Start-up voltage | 24 Vin models: 48 Vin models: | 9.0 VDC (or lower) 18 VDC (or lower) |
| Under voltage shut down (lock-out circuit) | 24 Vin models: 48 Vin models: | 8.5 VDC max. 17.5 VDC max. |
| Surge voltage (1 sec. max.) | 24 Vin models 48 Vin models | 50 V max. 100 V max. |
| Reflected ripple current | 24 Vin models 48 Vin models | 15 mA typ 10 mA typ. |
| Conducted noise | EN 55022 class A without external components | |
| ESD (electrostatic discharge) | EN 61000-4-2, air ± 8 kV, contact ± 6 kV, perf. criteria A | |
| Radiated immunity | EN 61000-4-3, 10 V/m, perf. criteria A | |
| Fast transient / surge (with external input capacitor) – external input capacitor | EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 1 kV perf. criteria A Nippon chemi-con KY 200 μ F, 100 V, ESR 48 mOhm | |
| Conducted immunity | EN 61000-4-6, 10 Vrms, perf. criteria A | |
| Short circuit input power | 2000 mW max. | |
| Internal power dissipation | 1200 mW max. | |

Output Specifications

| | | |
|---|--|--------------------------|
| Voltage set accuracy | ± 2 % max. | |
| Regulation | – Input variation Vin min. to Vin max. – Load variation 0 – 100 % | 1.0 % max. |
| | single output models dual output models balanced load | 1.0 % max. 2.0 % max. |
| Minimum load | not required | |
| Ripple and noise (20 MHz bandwidth) | 70 mVpk-pk max | |
| Transient response time (25% load step change) | 500 μ s max. | |
| Transient response deviation (25% load step change) | ± 5 % max. | |
| Temperature coefficient | ± 0.02 %/K | |
| Current limitation | >120 % of Iout max., constant current | |
| Short circuit protection | continuous | |

Output Specifications (continued)

| | | |
|-----------------|-----------------------|--------------------------------|
| Capacitive load | 3.3 VDC models: | 680 μ F max. |
| | 5.0 VDC models: | 470 μ F max. |
| | 12 VDC models: | 330 μ F max. |
| | 15 VDC models: | 220 μ F max. |
| | 24 VDC models: | 100 μ F max. |
| | \pm 5.0 VDC models: | 220 μ F max. (each output) |
| | \pm 12 VDC models: | 150 μ F max. (each output) |
| | \pm 15 VDC models: | 100 μ F max. (each output) |

General Specifications

| | | |
|--|---|--|
| Temperature ranges | - Operating (natural convection cooling 20 LFM) | -40°C to +85°C |
| | - Case temperature | +100°C max. |
| | - Storage | -55°C to +125°C |
| Derating | | 3.3 %/K above 70°C |
| Humidity (non condensing) | | 95 % rel H max. |
| Reliability, calculated MTBF (MIL-HDBK-217 F, at +25°C, ground benign) | | >1 Mio. h |
| Isolation voltage (60 sec.) | - Input/Output | 1'500 VDC or 3'000 VDC |
| Isolation capacitance | - Input/Output | 300 pF max. |
| Isolation resistance | - Input/Output (500 VDC) | >1'000 M Ohm |
| Switching frequency | | 90 kHz min. (pulse frequency modulation PFM) |
| Safety standards | | cUL/UL 60950-1, IEC/EN 60950-1 |
| Safety approvals | - CSA certificate of compliance | CAN/CSA-C22.2 No 60950-1-07, Am 1:2011 |
| | - CB test certificate | ANSI/UL Std No 60950-1, 2nd Ed, AM 1:2011 |
| | - Certification documents | IEC 60950-1:2005 2nd Ed, Am 1:2009 www.tracopower.com/overview/ten3win |
| Environmental compliance | - Reach | www.tracopower.com/overview/ten3win |
| | - RoHS | RoHS directive 2011/65/EU |

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

Physical Specifications

| | |
|-----------------------|--|
| Casing material | non conductive FR4 |
| Potting material | epoxy (UL 94V-0 rated) |
| Pin material | copper alloy with gold plated subplate |
| Weight | 12.8 g (0.45 oz) |
| Soldering temperature | max. 260°C / 10 sec. |

Outline Dimensions



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

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

ntc = not to connect



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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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