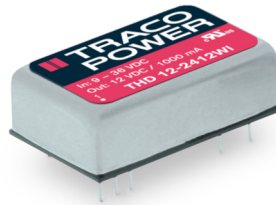


- Ultra-wide 4:1 input range
- High efficiency up to 85%
- I/O isolation 1500V
- Remote On/Off
- Under voltage lock-out circuit
- Shielded metal case with insulated Baseplate
- Continuous short-circuit protection
- Operating temp. range -40°C to $+85^{\circ}\text{C}$
- 3-year product warranty



The THD 12WI series is a range of high performance, isolated 12W DC/DC converter modules featuring ultra wide 4:1 input voltage ranges in a DIP-24 package with industry-standard footprint. Overload and overvoltage protection as well as remote On/Off are included as standard. Built-in filters for both input and output minimizes the need of external filtering. Full SMD-design with exclusive use of ceramic capacitors guarantees a high reliability and long product lifetime. Typical applications for these converters are industrial electronics, instrumentation, data communication systems and battery operated equipment with limited space available on the PCB.

Models

| Order Code | Input Voltage Range | Output 1 | | Output 2 | | Efficiency typ. |
|---------------|-----------------------------|------------------------------|------------------|----------|------------------|-----------------|
| | | Vnom | I _{max} | Vnom | I _{max} | |
| THD 12-2410WI | 9 - 36 VDC (24 VDC nom.) | 3.3 VDC | 3'500 mA | | | 84 % |
| THD 12-2411WI | | 5.1 VDC | 2'400 mA | | | 87 % |
| THD 12-2412WI | | 12 VDC | 1'000 mA | | | 87 % |
| THD 12-2413WI | | 15 VDC | 800 mA | | | 87 % |
| THD 12-2421WI | | +5 VDC | 1'200 mA | -5 VDC | 1'200 mA | 84 % |
| THD 12-2422WI | | +12 VDC | 500 mA | -12 VDC | 500 mA | 87 % |
| THD 12-2423WI | | +15 VDC | 400 mA | -15 VDC | 400 mA | 87 % |
| THD 12-4810WI | | 18 - 75 VDC (48 VDC nom.) | 3.3 VDC | 3'500 mA | | |
| THD 12-4811WI | 5.1 VDC | | 2'400 mA | | | 87 % |
| THD 12-4812WI | 12 VDC | | 1'000 mA | | | 87 % |
| THD 12-4813WI | 15 VDC | | 800 mA | | | 88 % |
| THD 12-4821WI | +5 VDC | | 1'200 mA | -5 VDC | 1'200 mA | 85 % |
| THD 12-4822WI | +12 VDC | | 500 mA | -12 VDC | 500 mA | 87 % |
| THD 12-4823WI | +15 VDC | | 400 mA | -15 VDC | 400 mA | 87 % |

Input Specifications

| | | |
|------------------------|----------------|--|
| Input Current | - At no load | 24 Vin models: 55 mA typ. (3.3 Vout model) 55 mA typ. (5.1 Vout model) 15 mA typ. (12 Vout model) 15 mA typ. (15 Vout model) 15 mA typ. (5 / -5 Vout model) 15 mA typ. (12 / -12 Vout model) 15 mA typ. (15 / -15 Vout model) |
| | - At full load | 24 Vin models: 610 mA typ. 48 Vin models: 310 mA typ. |
| Surge Voltage | | 24 Vin models: 50 VDC max. (100 ms max.) 48 Vin models: 100 VDC max. (100 ms max.) |
| Under Voltage Lockout | | 24 Vin models: 7 VDC min. / 8 VDC typ. / 8.8 VDC max. 48 Vin models: 15 VDC min. / 16 VDC typ. / 17.5 VDC max. |
| Recommended Input Fuse | | 24 Vin models: 2'500 mA (slow blow) 48 Vin models: 1'250 mA (slow blow) (The need of an external fuse has to be assessed in the final application.) |
| Input Filter | | Internal Pi-Type |

Output Specifications

| | | |
|---------------------------|--|---|
| Voltage Set Accuracy | | ±1.2% 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: 0.5% max. dual output models: 1% max. (Output 1) 1% max. (Output 2) |
| | - Cross Regulation (25% / 100% asym. load) | dual output models: 5% max. |
| Ripple and Noise | - 20 MHz Bandwidth | 85 mVp-p typ. |
| Capacitive Load | - single output | 3.3 Vout models: 2'000 µF max. 5.1 Vout models: 2'000 µF max. 12 Vout models: 430 µF max. 15 Vout models: 300 µF max. |
| | - dual output | 5 / -5 Vout models: 1'250 / 1'250 µF max. 12 / -12 Vout models: 200 / 200 µF max. 15 / -15 Vout models: 120 / 120 µF max. |
| Minimum Load | | Not required |
| Temperature Coefficient | | ±0.02 %/K max. |
| Start-up Time | | 450 ms typ. (Power On) 5 ms typ. (Remote On) |
| | | |
| Short Circuit Protection | | Continuous, Automatic recovery |
| Output Current Limitation | | 150% typ. of Iout max. |
| Overvoltage Protection | | 118 - 125% of Vout nom. (depending on model) 3.9 VDC typ. (3.3 Vout models) 6.2 VDC typ. (5.1 Vout models) 15 VDC typ. (12 Vout models) 18 VDC typ. (15 Vout models) |

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

| | | |
|--------------------|----------------------|--|
| Transient Response | - Response Deviation | 5% max. (75% to 100% Load Step) |
| | - Response Time | 250 μ s typ. (75% to 100% Load Step) |

Safety Specifications

| | | |
|-----------------------|-----------------------------|--|
| Standards | - IT / Multimedia Equipment | EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1 |
| | - Certification Documents | www.tracopower.com/thd12wi-safety-cert |
| Energy Source | - Output, acc. to 62368-1 | ES1 |
| Power Source | - Output, acc. to 62368-1 | PS1 |
| Pollution Degree | | PD 2 |
| Over Voltage Category | | Not mains connected |

EMC Specifications

| | | |
|-----------------|-----------------------------|--|
| EMI (Emissions) | - Conducted Emissions | EN 55032 class A (with external filter) EN 55032 class B (with external filter) |
| | - Radiated Emissions | EN 55032 class A (with external filter) EN 55032 class B (with external filter) |
| | External filter proposal: | www.tracopower.com/thd12wi-emc-filter |
| EMS (Immunity) | | EN 55024 (IT Equipment) EN 55035 (Multimedia) |
| | - Electrostatic Discharge | Air: EN 61000-4-2, ± 8 kV, perf. criteria A Contact: EN 61000-4-2, ± 6 kV, perf. criteria A |
| | - RF Electromagnetic Field | EN 61000-4-3, 10 V/m, perf. criteria A |
| | - EFT (Burst) / Surge | EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 1 kV, perf. criteria A |
| | Ext. input component: | Nippon chemi-con KY 220 μ F, 100 V |
| | - Conducted RF Disturbances | EN 61000-4-6, 10 Vrms, perf. criteria A |
| | - PF Magnetic Field | Continuous: EN 61000-4-8, 100 A/m, perf. criteria A 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A |

General Specifications

| | | |
|---------------------------|--|--|
| Relative Humidity | | 95% max. (non condensing) |
| Temperature Ranges | - Operating Temperature | -40°C to +85°C |
| | - Case Temperature | +105°C max. |
| | - Storage Temperature | -55°C to +125°C |
| Power Derating | - High Temperature | Depending on model |
| | See application note: | www.tracopower.com/thd12wi-cc |
| Cooling System | | Natural convection (20 LFM) |
| Remote Control | - Voltage Controlled Remote (passive = on) | On: 3.0 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin |
| | - Off Idle Input Current | 2.5 mA typ. |
| | - Remote Pin Input Current | -0.5 to 0.5 mA |
| Altitude During Operation | | 4'000 m max. |
| Regulator Topology | | Flyback Converter |
| Switching Frequency | | 360 - 440 kHz (PWM) |
| | | 400 kHz typ. (PWM) |
| Insulation System | | Functional Insulation |
| Isolation Test Voltage | - Input to Output, 60 s | 1'600 VDC |
| | - Input to Case, 60 s | 1'600 VDC |
| | - Output to Case, 60 s | 1'600 VDC |
| Isolation Resistance | - Input to Output, 500 VDC | 1'000 M Ω min. |

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

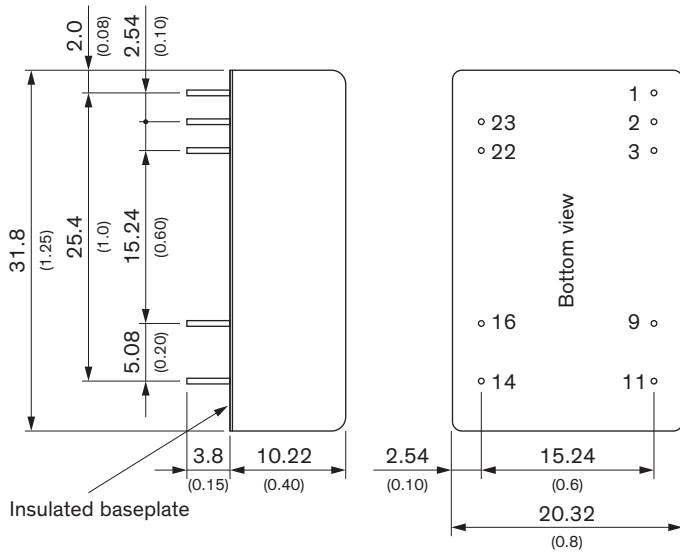
| | | |
|--------------------------|--|--|
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | 1'500 pF max. |
| Reliability | - Calculated MTBF | 2'090'000 h (MIL-HDBK-217F, ground benign) |
| Washing Process | | According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf |
| Environment | - Vibration - Thermal Shock | MIL-STD-810F MIL-STD-810F |
| Housing Material | | Copper, Nickel plated |
| Base Material | | Non-conductive FR4 (UL 94 V-0 rated) |
| Potting Material | | Epoxy (UL 94 V-0 rated) |
| Pin Material | | Copper |
| Pin Foundation Plating | | Nickel (2 - 3 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 | | DIP24 |
| Soldering Profile | | Lead-Free Wave Soldering 245°C / 10 s max. |
| Weight | | 18 g |
| Thermal Impedance | - Case to Ambient | 20.0 K/W typ. |
| Environmental Compliance | - REACH Declaration - RoHS Declaration - SCIP Reference Number | www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7(a), 7(c)-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule)) 952e6754-9097-4042-a284-2f13a33dbf55 |

Additional Information

| | |
|----------------------------|--|
| Supporting Documents | www.tracopower.com/overview/thd12wi |
| Frequently Asked Questions | www.tracopower.com/glossary-faq |
| Glossary | www.tracopower.com/info/glossary.pdf |

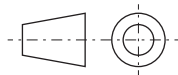
All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Outline Dimensions



| Pinout | | |
|--------|---------------|---------------|
| Pin | Single | Dual |
| 1 | Remote On/Off | Remote On/Off |
| 2 | -Vin (GND) | -Vin (GND) |
| 3 | -Vin (GND) | -Vin (GND) |
| 9 | NC | Common |
| 11 | NC | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Common |
| 22 | +Vin (Vcc) | +Vin (Vcc) |
| 23 | +Vin (Vcc) | +Vin (Vcc) |

NC: Not connected



Dimensions in mm (inch)
 Tolerances: x.x ±0.5 (±0.02)
 x.xx ±0.25 (±0.01)
 Pin Ø 0.5 ±0.1 (0.02 ±0.004)