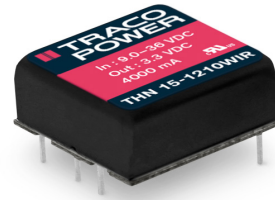


- Compact 1"x1"x0.4" standard package
- Ultra-wide 4:1 input voltage range  
9–36, 18–75, 36–160 VDC
- EN 50155 and EN 61373 approval for railway applications
- Qualification for fire behaviour according to EN 45545-2
- 3000 VDC I/O-isolation
- High efficiency up to 91%
- Operating temperature range –40°C to +90°C
- Under-voltage lock out circuit
- Adjustable output voltage & Remote On/Off



The THN 15WIR series is a family of ruggedized 15 Watt DC/DC converters for highest reliability in harsh environments. The converters have an increased resistance against electromagnetic interference, shock/vibration and thermal shock. The approvals according to standards EN 50155 and EN 61373 qualify them for railway and transportation systems. The qualification for the fire behaviour of components according to EN 45545-2 and the safety approval according IEC/EN 60950-1, UL60950-1 support a potential compliance test of the application. Built-in EMI 55032 class A filter, input under-voltage-lockout, short circuit protection, remote On/Off and output voltage trim are further features which facilitate the design in.

| Models         |                                  |                                 |                     |                 |
|----------------|----------------------------------|---------------------------------|---------------------|-----------------|
| Order code     | Input voltage                    | Output voltage                  | Output current max. | Efficiency typ. |
| THN 15-2410WIR | 9 - 36 VDC<br>(nominal 24 VDC)   | 3.3 VDC                         | 4500 mA             | 88 %            |
| THN 15-2411WIR |                                  | 5.0 VDC                         | 3000 mA             | 89 %            |
| THN 15-2412WIR |                                  | 12 VDC                          | 1300 mA             | 89 %            |
| THN 15-2413WIR |                                  | 15 VDC                          | 1000 mA             | 89 %            |
| THN 15-2415WIR |                                  | 24 VDC                          | 625 mA              | 90 %            |
| THN 15-2421WIR |                                  | ±5 VDC                          | ±1500 mA            | 86 %            |
| THN 15-2422WIR |                                  | ±12 VDC                         | ±625 mA             | 89 %            |
| THN 15-2423WIR |                                  | ±15 VDC                         | ±500 mA             | 89 %            |
| THN 15-2425WIR |                                  | ±24 VDC                         | ±315 mA             | 91 %            |
| THN 15-4810WIR |                                  | 18 - 75 VDC<br>(nominal 48 VDC) | 3.3 VDC             | 4500 mA         |
| THN 15-4811WIR | 5.0 VDC                          |                                 | 3000 mA             | 89 %            |
| THN 15-4812WIR | 12 VDC                           |                                 | 1300 mA             | 89 %            |
| THN 15-4813WIR | 15 VDC                           |                                 | 1000 mA             | 89 %            |
| THN 15-4815WIR | 24 VDC                           |                                 | 625 mA              | 91 %            |
| THN 15-4821WIR | ±5 VDC                           |                                 | ±1500 mA            | 86 %            |
| THN 15-4822WIR | ±12 VDC                          |                                 | ±625 mA             | 90 %            |
| THN 15-4823WIR | ±15 VDC                          |                                 | ±500 mA             | 89 %            |
| THN 15-4825WIR | ±24 VDC                          |                                 | ±315 mA             | 90 %            |
| THN 15-7210WIR | 36 - 160 VDC<br>(nominal 72 VDC) |                                 | 3.3 VDC             | 4500 mA         |
| THN 15-7211WIR |                                  | 5.0 VDC                         | 3000 mA             | 89 %            |
| THN 15-7212WIR |                                  | 12 VDC                          | 1300 mA             | 89 %            |
| THN 15-7213WIR |                                  | 15 VDC                          | 1000 mA             | 89 %            |
| THN 15-7215WIR |                                  | 24 VDC                          | 625 mA              | 90 %            |
| THN 15-7221WIR |                                  | ±5 VDC                          | ±1500 mA            | 85 %            |
| THN 15-7222WIR |                                  | ±12 VDC                         | ±625 mA             | 89 %            |
| THN 15-7223WIR |                                  | ±15 VDC                         | ±500 mA             | 89 %            |
| THN 15-7225WIR |                                  | ±24 VDC                         | ±315 mA             | 90 %            |

## Input Specifications

|                                                |                                                                                                                                                                               |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input current no load                          | 24 Vin models: 12 mA typ.<br>48 Vin models: 10 mA typ.<br>72 Vin models: 8 mA typ.                                                                                            |
| Surge voltage (1 s max.)                       | 24 Vin models: 50 V max.<br>48 Vin models: 100 V max.<br>72 Vin models: 185 V max.                                                                                            |
| Start-up voltage                               | 24 Vin models: 9 VDC (or lower)<br>48 Vin models: 18 VDC (or lower)<br>72 Vin models: 38 VDC (or lower)                                                                       |
| Start-up time                                  | 40 ms max.                                                                                                                                                                    |
| Under voltage shut down                        | 24 Vin models: 8 VDC typ.<br>48 Vin models: 16 VDC typ.<br>72 Vin models: 35 VDC typ.                                                                                         |
| Input filter                                   | Pi-type                                                                                                                                                                       |
| Reflected input ripple current                 | 30 mA <sub>p-p</sub> typ.                                                                                                                                                     |
| Electromagnetic compatibility (EMC), Emissions | EN 55011, EN 55032<br>class A (internal), class B (with external components)                                                                                                  |
| Electromagnetic compatibility (EMC), Immunity  | EN 55024, EN 50155                                                                                                                                                            |
| – Electrostatic discharge (ESD)                | EN 61000-4-2, ±8 kV/±6 kV, perf. criteria A                                                                                                                                   |
| – Radiated RF field immunity                   | EN 61000-4-3, 10 V/m, perf. criteria A                                                                                                                                        |
| – Electrical fast transient / Surge immunity   | EN 61000-4-4, ±2 kV, perf. criteria A<br>EN 61000-4-5, ±2 kV, perf. criteria A                                                                                                |
| – with external components:                    | 24 Vin models: capacitor 220µF/100V and TVS (58V, 3kW)<br>48 Vin models: Nippon chemi-con KY capacitor 220µF/100V<br>72 Vin models: capacitor 150µF/200V and TVS (300V, 600W) |
| – Immunity to conducted RF disturbances        | EN 61000-4-6, 10 V <sub>rms</sub> , perf. criteria A                                                                                                                          |
| – Magnetic field immunity                      | EN 61000-4-8,<br>100 A/m continuous, perf. criteria A<br>1000 A/m 1s, perf. criteria A                                                                                        |

## Output Specifications

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage set accuracy                                    | ±1 % max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Voltage adjustability (by connecting external resistor) | 12, 15 VDC models: –10 % / +20 %<br>other models: ±10 %                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Regulation                                              | – Input variation<br>single output: 0.2 % max.<br>dual output: 0.5 % max.<br>– Load variation 0 – 100 %<br>single output: 0.2 % max.<br>dual output: 1 % max.<br>– cross regulation (asymmetrical load 25%/100 %)<br>5 % max.                                                                                                                                                                                                                                                           |
| Minimum load                                            | not required                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Ripple and noise (20 MHz Bandwidth)                     | –Single output<br>3.3 & 5.0 VDC models: 75 mV <sub>p-p</sub> typ. (with 10µF/6.3V X7R MLCC)<br>12 & 15 VDC models: 100 mV <sub>p-p</sub> typ. (with 1µF/25 V X7R MLCC)<br>24 VDC model: 125 mV <sub>p-p</sub> typ. (with 2.2µF/50 V X7R MLCC)<br>–Dual output<br>5 VDC model: 75 mV <sub>p-p</sub> typ. (each 10µF / 6.3V X7R MLCC)<br>12 & 15 VDC models: 100 mV <sub>p-p</sub> typ. (each 1µF / 25 V X7R MLCC)<br>24 VDC model: 125 mV <sub>p-p</sub> typ. (each 2.2µF/50 V X7R MLCC) |
| Transient Response (25% load step change)               | 250 µs typ.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| – Recovery time                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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

### Output Specifications (continued)

|                          |                |                                                                                                                                                                                      |
|--------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Current limitation       |                | at 170% typ. of I <sub>out</sub> max.                                                                                                                                                |
| Short circuit protection |                | continuous, automatic recovery                                                                                                                                                       |
| Overvoltage protection   |                | 3.3 VDC model: 3.7 – 5.4 VDC<br>5.0 VDC model: 5.6 – 7.0 VDC<br>12 VDC model: 13.5 – 19.6 VDC<br>15VDC model: 18.3 – 22.0 VDC<br>24 VDC model: 29.1 – 32.5 VDC                       |
| Capacitive load          | –Single output | 3.3 VDC models: 5'200 µF max.<br>5.0 VDC models: 3'600 µF max.<br>12 VDC models: 600 µF max.<br>15 VDC models: 500 µF max.<br>24 VDC models: 200 µF max.                             |
|                          | –Dual output   | ±5 VDC models: ±1'500 µF max. (each output)<br>±12 VDC models: ±360 µF max. (each output)<br>±15 VDC models: ±250 µF max. (each output)<br>±24VDC models: ±100 µF max. (each output) |

### General Specifications

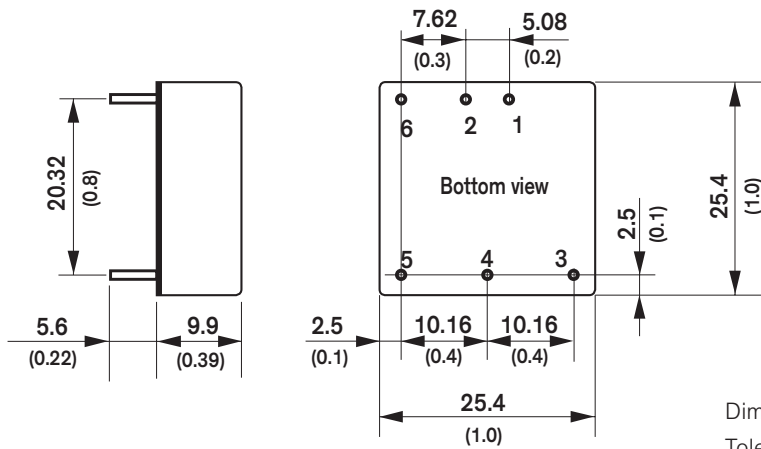
|                                                                      |                                                                                                     |                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature ranges                                                   | – Operating (convection cooling 20LFM, 0,1m/s)<br>– Case temperature<br>– Storage temperature       | –40°C to +90°C (with derating)<br>+105°C max.<br>–55°C to +125°C                                                                                                                                                                                                      |
| Derating                                                             |                                                                                                     | 3.3 %/K above 75°C                                                                                                                                                                                                                                                    |
| Humidity (non condensing)                                            |                                                                                                     | 5 – 95 % rel H max.                                                                                                                                                                                                                                                   |
| Temperature coefficient                                              |                                                                                                     | ±0.02 %/K max.                                                                                                                                                                                                                                                        |
| Thermal impedance                                                    | without heatsink:<br>with heatsink:                                                                 | 17.0 K/W typ.<br>15.3 K/W typ.                                                                                                                                                                                                                                        |
| Thermal shock                                                        |                                                                                                     | acc. MIL-STD-810F                                                                                                                                                                                                                                                     |
| Shock & Vibration                                                    |                                                                                                     | acc. MIL-STD-810F, EN61373                                                                                                                                                                                                                                            |
| Isolation voltage                                                    | – Input to Output isolation voltage (60 sec.)<br>– Input/Output to Case isolation voltage (60 sec.) | 3'000 VDC<br>1'600 VDC                                                                                                                                                                                                                                                |
| Isolation capacitance (input/output)                                 |                                                                                                     | 3'000 pF max.                                                                                                                                                                                                                                                         |
| Isolation resistance (input/output)                                  |                                                                                                     | >1 Gohm                                                                                                                                                                                                                                                               |
| Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign) |                                                                                                     | 1'600'000 h                                                                                                                                                                                                                                                           |
| Switching frequency                                                  | 3.3 & 5.0 VDC models:<br>other models:                                                              | 245 kHz typ. (±25 kHz)<br>300 kHz typ. (±30 kHz)                                                                                                                                                                                                                      |
| Remote On/Off                                                        | – On:<br>– Off:<br>– Off idle current:                                                              | 3.0 to 15 VDC or open circuit<br>0 to 1.2 VDC or short circuit pin 6 and pin 2<br>2.5 mA typ.                                                                                                                                                                         |
| Safety standards /approvals                                          |                                                                                                     | IEC/EN 60950-1<br>UL 60950-1<br><a href="http://www.tracopower.com/overview/thn15wir">www.tracopower.com/overview/thn15wir</a>                                                                                                                                        |
| Environmental compliance                                             | – Reach<br>– RoHS<br>– Flammability identified acc. EN 45545-2                                      | <a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a><br>RoHS directive 2011/65/EU<br><a href="http://www.tracopower.com/info/en45545-declaration.pdf">www.tracopower.com/info/en45545-declaration.pdf</a> |

### Physical Specifications

|                       |                           |
|-----------------------|---------------------------|
| Casing material       | copper                    |
| Base material         | FR4 PCB                   |
| Potting material      | Silicone (UL94 V-0 rated) |
| Package weight        | 16.5 g (0,58 oz)          |
| Soldering temperature | 260°C / 10 s max.         |

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

### Outline Dimensions

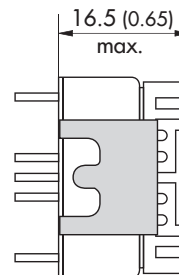
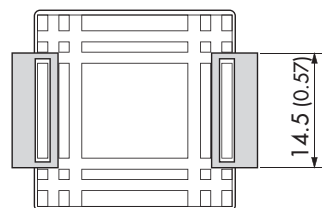
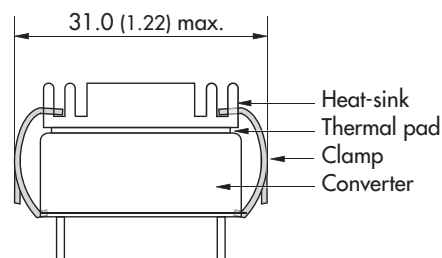
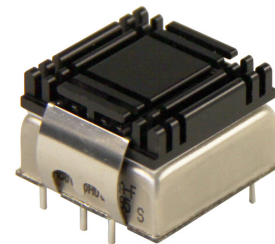


| Pin-Out |        |        |
|---------|--------|--------|
| Pin     | Single | Dual   |
| 1       | +Vin   | +Vin   |
| 2       | -Vin   | -Vin   |
| 3       | +Vout  | +Vout  |
| 4       | Trim   | Common |
| 5       | -Vout  | -Vout  |
| 6       | On/Off | On/Off |

Dimensions in [mm], ( ) = Inch  
 Tolerances:  $\pm 0.5$  (0.02)  
 Pin pitch tolerance:  $\pm 0.25$  (0.01)  
 Pin diameter: 1.0 (0.04)  $\pm 0.1$  (0.004)

### Optional heatsink

|                   |                                 |
|-------------------|---------------------------------|
| <b>Order code</b> | THN-HS1                         |
| <b>Content</b>    | Heatsink, thermal pad, 2 clamps |
| <b>Material</b>   | Aluminum                        |
| <b>Finish</b>     | Anodic treatment (black)        |
| <b>Weight</b>     | 8g (0.28 oz) without converter  |



Dimensions in mm, ( ) = Inch



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.