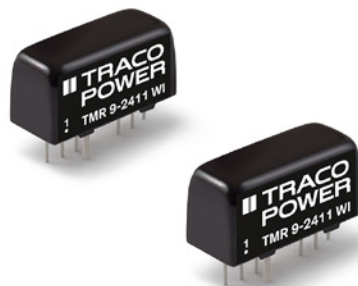


#### Features

- ◆ Highest power density in SIP package
- ◆ Ultra wide 4:1 input voltage range
- ◆ Ultra-compact SIP-8 package
- ◆ Smallest footprint 9W converter
- ◆ Full SMD design
- ◆ Temperature range  $-40^{\circ}$  to  $+85^{\circ}\text{C}$
- ◆ High efficiency up to 89%
- ◆ Indefinite short-circuit protection
- ◆ I/O isolation 1500 VDC
- ◆ Remote On/Off control
- ◆ Fully RoHS compliant
- ◆ 3-year product warranty



The TMR-9WI series is a new family of isolated 9W dc-dc converter modules with regulated output, featuring ultra wide 4:1 input voltage ranges. The product comes in a ultra-compact SIP-8 metal package with a small footprint occupying only 2.0 cm<sup>2</sup> (0.3 square in.) of board space.

An excellent efficiency allows  $-40^{\circ}$  to  $+60^{\circ}\text{C}$  operation temperatures without derating. Further features include remote On/Off control and continuous short circuit protection. The very compact dimensions of these converters make them an ideal solution for many space critical applications in communication equipment, instrumentation and industrial electronics.

#### Models

| Order code   | Input voltage range             | Output voltage | Output current max. | Efficiency typ. |
|--------------|---------------------------------|----------------|---------------------|-----------------|
| TMR 9-2410WI | 9 – 36 VDC<br>(24 VDC nominal)  | 3.3 VDC        | 2000 mA             | 82 %            |
| TMR 9-2411WI |                                 | 5 VDC          | 1600 mA             | 85 %            |
| TMR 9-2419WI |                                 | 9 VDC          | 1000 mA             | 86 %            |
| TMR 9-2412WI |                                 | 12 VDC         | 750 mA              | 88 %            |
| TMR 9-2413WI |                                 | 15 VDC         | 600 mA              | 89 %            |
| TMR 9-2415WI |                                 | 24 VDC         | 375 mA              | 89 %            |
| TMR 9-2421WI |                                 | $\pm 5$ VDC    | $\pm 800$ mA        | 85 %            |
| TMR 9-2422WI |                                 | $\pm 12$ VDC   | $\pm 375$ mA        | 88 %            |
| TMR 9-2423WI |                                 | $\pm 15$ VDC   | $\pm 300$ mA        | 88 %            |
| TMR 9-4810WI | 18 – 75 VDC<br>(48 VDC nominal) | 3.3 VDC        | 2000 mA             | 82 %            |
| TMR 9-4811WI |                                 | 5 VDC          | 1600 mA             | 85 %            |
| TMR 9-4819WI |                                 | 9 VDC          | 1000 mA             | 86 %            |
| TMR 9-4812WI |                                 | 12 VDC         | 750 mA              | 89 %            |
| TMR 9-4813WI |                                 | 15 VDC         | 600 mA              | 88 %            |
| TMR 9-4815WI |                                 | 24 VDC         | 375 mA              | 88 %            |
| TMR 9-4821WI |                                 | $\pm 5$ VDC    | $\pm 800$ mA        | 85 %            |
| TMR 9-4822WI |                                 | $\pm 12$ VDC   | $\pm 375$ mA        | 87 %            |
| TMR 9-4823WI |                                 | $\pm 15$ VDC   | $\pm 300$ mA        | 87 %            |

## Input Specifications

|                                                        |                                                                                                              |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Input current at no load<br>(nominal input voltage)    | 24 V models: 9 mA typ.<br>48 V models: 5 mA typ.                                                             |
| Surge voltage (1 sec. max.)                            | 24 V models: 50 V max.<br>48 V models: 100 V max.                                                            |
| Conducted noise                                        | EN 55022 class A internal filter                                                                             |
| ESD (electrostatic discharge)                          | EN 61000-4-2, air $\pm 8$ kV, contact $\pm 6$ kV, perf. criteria A                                           |
| Radiated immunity                                      | EN 61000-4-3, 20 V/m, perf. criteria A                                                                       |
| Fast transient / surge (with external input capacitor) | EN 61000-4-4, $\pm 2$ kV, perf. criteria A<br>EN 61000-4-5, $\pm 2$ kV perf. criteria A                      |
| – external input capacitor                             | all models: Nippon chemi-con KY 220 $\mu$ F, 100 V                                                           |
| – external TVS                                         | 24 V models: SMDJ70A, 70 V, 3000 W peak pulse power<br>48 V models: SMDJ120A, 120 V, 3000 W peak pulse power |
| Conducted immunity                                     | EN 61000-4-6, 10 Vrms, perf. criteria A                                                                      |

## Output Specifications

|                                                        |                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage set accuracy                                   | $\pm 1$ % max                                                                                                                                                                                                                                                                                                                                                 |
| Regulation                                             | – Input variation Vin min. to Vin max. 0.2 % max.<br>– Load variation 0 – 100% single output models: 1.0 % max.<br>dual output models: 1.0 % max. balanced load<br>– Load cross regulation 25/100% 5.0 % max. (dual output models)                                                                                                                            |
| Minimum load                                           | not required                                                                                                                                                                                                                                                                                                                                                  |
| Ripple and noise (20 MHz Bandwidth)                    | 3.3, 5 & 9 VDC models: 50 mVpk-pk typ.<br>12, 15 & 24 VDC models: 75 mVpk-pk typ.                                                                                                                                                                                                                                                                             |
| Transient response setting time (25% load step change) | 250 $\mu$ s typ.                                                                                                                                                                                                                                                                                                                                              |
| Short circuit protection                               | indefinite, automatic recovery                                                                                                                                                                                                                                                                                                                                |
| Over load protection                                   | 180 % of nom. Iout typ. (hiccup)                                                                                                                                                                                                                                                                                                                              |
| Start up time                                          | – Power On 50 ms typ.<br>(constant resistive load) – Remote On 50 ms typ.                                                                                                                                                                                                                                                                                     |
| Capacitive load                                        | 3.3 VDC / 5 VDC output models: 2600 $\mu$ F max. / 1300 $\mu$ F max.<br>9 VDC output models: 800 $\mu$ F max.<br>12 VDC & 15 VDC output models: 560 $\mu$ F max.<br>24 VDC output models: 200 $\mu$ F max.<br>$\pm 5$ VDC / $\pm 12$ VDC output models: $\pm 800$ $\mu$ F max. / $\pm 390$ $\mu$ F max.<br>$\pm 15$ VDC output models: $\pm 200$ $\mu$ F max. |

## General Specifications

|                                             |                                                                                                                                                |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature ranges                          | – Operating –40°C to +85°C<br>– Case temperature +100°C max.<br>– Storage –55°C to +125°C                                                      |
| Load derating                               | 3.3 VDC model: 2.0 %/K above 50°C<br>other models: 2.5 %/K above 60°C                                                                          |
| Thermal shock, mechanical shock & vibration | EN 61373, MIL-STD-810F<br>– Test conditions <a href="http://www.tracopower.com/products/mil810.pdf">www.tracopower.com/products/mil810.pdf</a> |
| Humidity (non condensing)                   | 5–95 % rel. H max.                                                                                                                             |
| Temperature coefficient                     | $\pm 0.02$ %/K                                                                                                                                 |

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

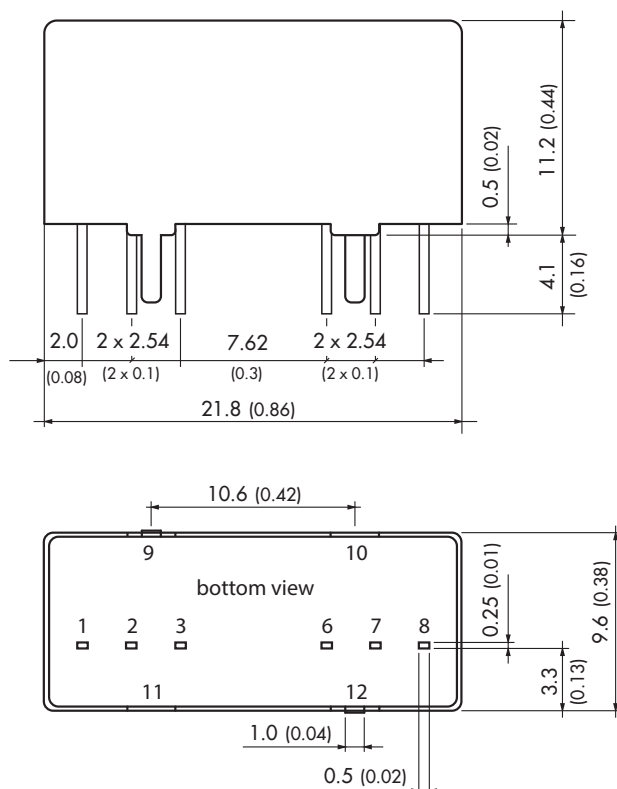
## General Specifications

|                                                               |                                                                                                                          |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Reliability, calculated MTBF (MIL-HDBK-217F)                  | >2.9 Mio h                                                                                                               |
| Isolation voltage (60sec.) – Input/Output                     | 1500 VDC                                                                                                                 |
| Isolation capacitance – Input/Output                          | 50 pF max.                                                                                                               |
| Isolation resistance – Input/Output (500 VDC)                 | >1 GOhm                                                                                                                  |
| Switching frequency                                           | single output models: 400 kHz typ.<br>dual output models: 500 kHz typ.                                                   |
| Remote On/Off – On:<br>– Off:<br>– Off stand by input current | open or high impedance<br>2...4 mA current applied via 1KOhm resistor<br>2.5 mA max.                                     |
| Safety standards – Certification documents                    | IEC/EN 60950-1, UL 60950-1<br><a href="http://www.tracopower.com/overview/tmr9wi">www.tracopower.com/overview/tmr9wi</a> |
| Altitude during operation                                     | tbd                                                                                                                      |
| Environmental compliance – Reach<br>– RoHS                    | <a href="http://www.tracopower.com/overview/tmr9wi">www.tracopower.com/overview/tmr9wi</a><br>RoHS directive 2011/65/EU  |

## Physical Specifications

|                  |                            |
|------------------|----------------------------|
| Casing material  | copper                     |
| Potting material | silicone, (UL 94V-0 rated) |
| Weight           | 5.9 g (0.21oz)             |

## Outline Dimensions



## Pin-Out

| Pin | Single        | Dual          |
|-----|---------------|---------------|
| 1   | -Vin (GND)    | -Vin (GND)    |
| 2   | +Vin (Vcc)    | +Vin (Vcc)    |
| 3   | Remote On/Off | Remote On/Off |
| 6   | +Vout         | +Vout         |
| 7   | -Vout         | Common        |
| 8   | No function   | -Vout         |
| 9   | Case          | Case          |
| 10  | Stand off     | Stand off     |
| 11  | Stand off     | Stand off     |
| 12  | Case          | Case          |

Dimensions in [mm], ( ) = Inch  
Tolerances:  $\pm 0.5$  ( $\pm 0.02$ )  
Pin pitch tolerances:  $\pm 0.25$  ( $\pm 0.01$ )

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)



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.);

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- 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

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