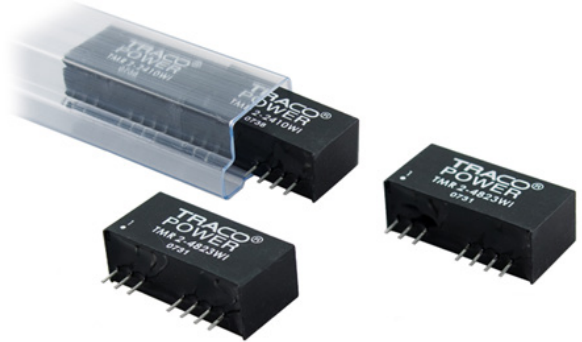


## Features

- ◆ Ultra-wide 4:1 input range
- ◆ SIP-9 package
- ◆ Full SMD design
- ◆ Temperature range  $-40$  to  $+85^{\circ}\text{C}$
- ◆ High efficiency
- ◆ Excellent load and line regulation
- ◆ Indefinite short-circuit protection
- ◆ I/O isolation 1500 VDC
- ◆ Remote On/Off control
- ◆ Fully RoHS compliant
- ◆ 3-year product warranty



The TMR-2WI series is a new family of isolated 2W dc-dc converter modules with regulated output, featuring ultra-wide 4:1 input voltage ranges of 9-36 VDC or 18-75 VDC. The product comes in a ultra-compact SIP-9 plastic package. An excellent efficiency up to 84% allows  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  operation temperatures at full load. Further features include remote On/Off control and continuous short circuit protection. Typical applications for these ultra-compact converters are battery operated equipment and distributed power architectures in communication, instrumentation and industrial electronics, everywhere where space on the PCB is critical.

## Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TMR 2-2410WI	<b>9 – 36 VDC</b> (24 VDC nominal)	3.3 VDC	500 mA	71 %
TMR 2-2411WI		5 VDC	400 mA	76 %
TMR 2-2412WI		12 VDC	165 mA	79 %
TMR 2-2413WI		15 VDC	135 mA	80 %
TMR 2-2421WI		$\pm 5$ VDC	$\pm 200$ mA	73 %
TMR 2-2422WI		$\pm 12$ VDC	$\pm 85$ mA	77 %
TMR 2-2423WI		$\pm 15$ VDC	$\pm 65$ mA	79 %
TMR 2-4810WI	<b>18 – 75 VDC</b> (48 VDC nominal)	3.3 VDC	500 mA	70 %
TMR 2-4811WI		5 VDC	400 mA	72 %
TMR 2-4812WI		12 VDC	165 mA	78 %
TMR 2-4813WI		15 VDC	135 mA	78 %
TMR 2-4821WI		$\pm 5$ VDC	$\pm 200$ mA	70 %
TMR 2-4822WI		$\pm 12$ VDC	$\pm 85$ mA	76 %
TMR 2-4823WI		$\pm 15$ VDC	$\pm 65$ mA	76 %

## Input Specifications

Input current at no load (nominal input)	24 Vin models: 20 mA typ. 48 Vin models: 15 mA typ.
Input current at full load (nominal input)	24 Vin models: 110 mA typ. 48 Vin models: 55 mA typ.
Surge voltage (100 msec. max.)	24 Vin models: 50 V max. 48 Vin models: 100 V max.
Reverse voltage protection	0.5 A max.
Input Filter	capacitor type
Start up time	<1ms (at nominal input and resistive load)

## Output Specifications

Voltage set accuracy	±2 %
Regulation	– Input variation Vin min. to Vin max. 0.5 % max. – Load variation 25 – 100 % single output models: 0.75 % max. dual output models: 2.0 % max. (balanced load)
Minimum load	25 % of rated max current (operation at lower load condition is safe but a higher output ripple will be experienced)
Temperature coefficient	±0.02 %/°C max.
Ripple and noise (20 MHz Bandwidth)	50 mVpk-pk max
Transient response (25 % load step change)	300 µs max.
Short circuit protection	continuous (automatic recovery)
Capacitive load	3.3 VDC models: 2'200 µF max. 5 VDC models: 1'000 µF max. 12 VDC models: 170 µF max. 15VDC models: 110 µF max. ±5 VDC models: 470 µF max. (each output) ±12 VDC models: 100 µF max. (each output) ±15 VDC models: 47 µF max. (each output)

## General Specifications

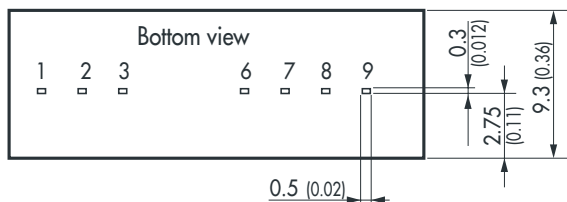
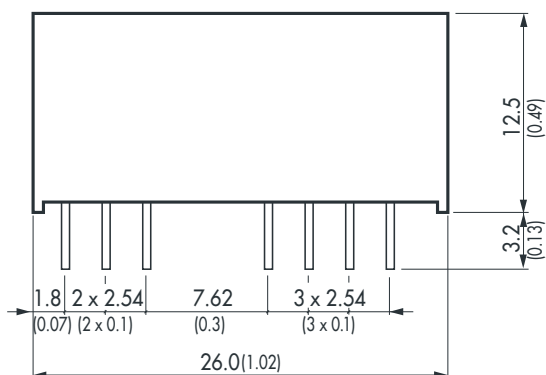
Temperature ranges	– Operating –40°C to +85°C – Case temperature +90°C max. – Storage –55°C to +105°C
Derating (convection cooling)	2.9 %/K above 65°C
Humidity (non condensing)	95 % rel. H max.
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)	>1 Mio h
Isolation voltage (60 sec.) – Input/Output	1'500 VDC
Isolation capacitance – Input/Output	500 pF max.
Isolation resistance – Input/Output (500 VDC)	>1'000 M Ohm
Switching frequency	100 to 650 kHz (PFM)
Remote On/Off control	– On: <0.6 VDC or open circuit – Off: 2.9 to 15 VDC – Off stand by input current 1 mA typ / 3 mA max.
Environmental compliance	– Reach – 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 plastic
Potting material	epoxy (UL 94V-0 rated)
Weight	6.5 g (0.23 oz)
Soldering temperature	max. 260°C / 10 sec.

## Outline Dimensions



Pin	Pin-Out	
	Single	Dual
1	-Vin (GND)	-Vin (GND)
2	+Vin (Vcc)	+Vin (Vcc)
3	Remote On/Off	Remote On/Off
6	+Vout	+Vout
7	ntc	Common
8	ntc	ntc
9	-Vout	-Vout

(ntc = not to connect)

Dimensions in [mm], ( ) = Inch  
Pin diameter  $\varnothing 0.5 \pm 0.05$  (0.02  $\pm$  0.002)  
Tolerances  $\pm 0.5$  ( $\pm 0.02$ )  
Pin pitch tolerances  $\pm 0.2$  ( $\pm 0.008$ )