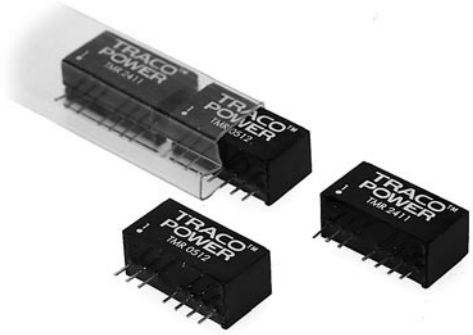
DC/DC Converters

TMR 2 Series, 2 Watt

RoHS compliant

Features

- Wide 2:1 Input Voltage Range
- Compact SIP-8 Package
- Small Footprint
- Full SMD Design
- Temperature Range –40° to +75°C
- High Efficiency
- Excellent Load and Line Regulation
- Indefinite Short-circuit Protection
- I/O-Isolation 1000VDC
- Remote On/Off Control
- Fully RoHS compliant
- 3 Year Product Warranty



The TMR-2 series is a family of isolated 2W dc-dc converter modules with regulated output, featuring wide 2:1 input voltage ranges. The product comes in a compact SIP-8 plastic package with small footprint occupying only 2.0 cm2 (0.3 square in.) of board space.
An excellent efficiency allows –40° to +75°C operation temperatures at full load. Further features include remote On/Off control and continuous short circuit protection. The ultra-compact dimensions of these converters make them an ideal solution for many space critical applications in communication equipment, instrumentation and industrial electronics.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TMR 0510	4.5 – 9.0 VDC	3.3 VDC	500 mA	64 %
TMR 0511		5 VDC	400 mA	66 %
TMR 0512		12 VDC	165 mA	71 %
TMR 0521		±5 VDC	±200 mA	64 %
TMR 0522		±12 VDC	±85 mA	69 %
TMR 0523		±15 VDC	±65 mA	71 %
TMR 1210	9 – 18 VDC	3.3 VDC	500 mA	70 %
TMR 1211		5 VDC	400 mA	73 %
TMR 1212		12 VDC	165 mA	80 %
TMR 1221		±5 VDC	±200 mA	73 %
TMR 1222		±12 VDC	±85 mA	78 %
TMR 1223		±15 VDC	±65 mA	78 %
TMR 2410	18 – 36 VDC	3.3 VDC	500 mA	71 %
TMR 2411		5 VDC	400 mA	74 %
TMR 2412		12 VDC	165 mA	81 %
TMR 2421		±5 VDC	±200 mA	74 %
TMR 2422		±12 VDC	±85 mA	78 %
TMR 2423		±15 VDC	±65 mA	80 %
TMR 4810	36 – 75 VDC	3.3 VDC	500 mA	70 %
TMR 4811		5 VDC	400 mA	73 %
TMR 4812		12 VDC	165 mA	79 %
TMR 4821		±5 VDC	±200 mA	71 %
TMR 4822		±12 VDC	±85 mA	77 %
TMR 4823		±15 VDC	±65 mA	77 %

Input Specifications

Input current at full load (nominal input)	5 Vin models:	645 mA max.
	12 Vin models:	242 mA max.
	24 Vin models:	117 mA max.
	48 Vin models:	62 mA max.
Surge voltage (100 msec. max.)	5 Vin models:	15 V max.
	12 Vin models:	25 V max.
	24 Vin models:	50 V max.
	48 Vin models:	100 V max.
Input voltage variation (dv/dt)		5 V/ms, max. (complies to ETS 300 132 part. 4.4)
Input Filter		capacitor type
Start up time		1 ms typ. (at nominal input and resistive load)

Output Specifications

Voltage set accuracy		±1 %
Regulation	– Input variation Vin min. to Vin max.	0.5 % max.
	– Load variation 10–100 % 3.3 VDC models:	0.85 % max.
	single output models:	0.75 % max.
	dual output models balanced load:	1.0 % max.
	dual output models asymetric load:	5.0 % max. (25% /100%)
Ripple and noise (20 MHz Bandwidth)		50 mVpk-pk max.
Temperature coefficient		± 0.1 %/°C
Short circuit protection		continuous, automatic recovery
Minimum load		10% of rated max current (operation at lower load condition is safe but a higher output ripple will be experianced)
Capacitive load	3.3 VDC / 5 VDC output models:	2'200 µF max. / 1'000 µF max.
	12 VDC / ±5 VDC output models:	170 µF max. / ±470 µF max.
	±12 VDC / ±15 VDC output models:	100 µF max. / ± 47 µF max.

General Specifications

Temperature ranges	– Operating	– 40 °C ... + 75 °C (no derating)
	– Storage	– 55 °C ... + 105 °C
Humidity (non condensing)		95 % rel. H max.
Reliability, calculated MTBF (MIL-HDBK-217 F)		> 2.3 Mio h @ 25°C
Isolation voltage (60 sec)	– Input/Output	1'000 VDC
Isolation capacity	– Input/Output	300 pF max.
Isolation resistance	– Input/Output (500 VDC)	> 1'000 MOhm
Switching frequency		100 to 650 kHz (PFM)
Remote On/Off	– On:	open or high impedance
	– Off:	4...8 mA input current applied via 1KW resistor
	– Off stand by input current	max. 1mA

Physical Specifications

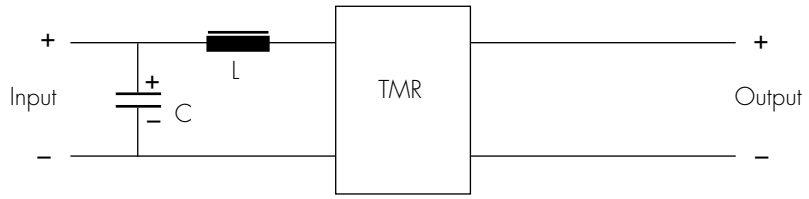
Case material	non-conductive plastic
Potting material	epoxy, UL 94V-0 - rated
Weight	4.8g (0.17oz)

Application notes can be downloaded under:
www.tracopower.com/products/tmr2_application.pdf

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

EMC Characteristics

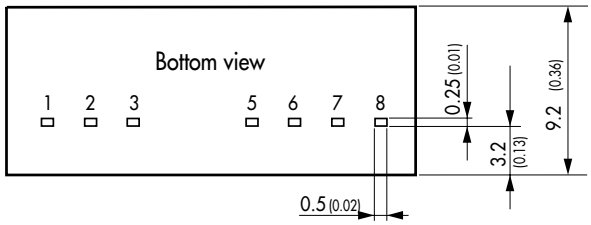
- Use an electrolytic low ESR capacitor at input side to reduce reflected ripple current.
- In order to meet EN55022 class B additionally use a choke to build an L/C filter as follows:

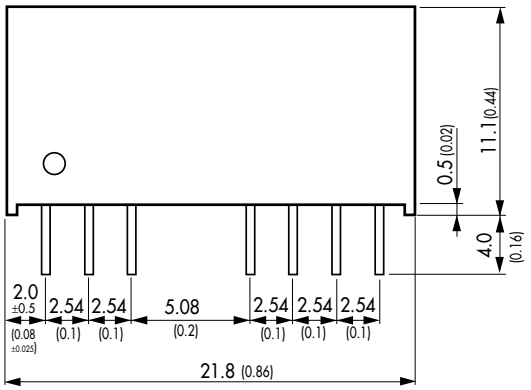


Recommended values for filter:

Input	C	L
5VDC	100µF	10µH
12VDC	100µF	10µH
24VDC	10µF	120µH
48VDC	10µF	120µH

Outline Dimensions mm (inches)





Pin-Out		
Pin	**Single**	**Dual**
1	–Vin (GND)	–Vin (GND)
2	+Vin (Vcc)	+Vin (Vcc)
3	Remote On/Off	Remote On/Off
5	No function	No function
6	+Vout	+Vout
7	–Vout	Common
8	No function	–Vout