- **Highest power density in SIP package**
- **Wide 2:1 input voltage range**
- **Ultra-compact SIP-8 package**
- **Smallest footprint 6W converter**
- **Temperature range –40° to +65°C**
- **High efficiency up to 86%**
- **Indefinite short-circuit protection**
- **I/O isolation 1600 VDC**
- **Remote On/Off control**
- **Fully RoHS compliant**
- **3-year product warranty**

The TMR-6 series is a new family of isolated 6W dc-dc converter modules with regulated output, featuring wide 2:1 input voltage ranges. The product comes in a ultra-compact SIP-8 plastic package with a small footprint occupying only 2.0 cm2 (0.3 square in.) of board space.
An excellent efficiency allows –40° to +65°C operation temperatures. 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 6-0510	**4.5 – 9.0 VDC** (5 VDC nominal)	3.3 VDC	1300 mA	77 %
TMR 6-0511		5 VDC	1200 mA	81 %
TMR 6-0519		9 VDC	666 mA	83 %
TMR 6-0512		12 VDC	500 mA	84 %
TMR 6-0513		15 VDC	400 mA	84 %
TMR 6-0515		24 VDC	250 mA	84 %
TMR 6-0521		±5 VDC	±600 mA	81 %
TMR 6-0522		±12 VDC	±250 mA	84 %
TMR 6-0523		±15 VDC	±200 mA	84 %
TMR 6-1210	**9 – 18 VDC** (12 VDC nominal)	3.3 VDC	1300 mA	78 %
TMR 6-1211		5 VDC	1200 mA	83 %
TMR 6-1219		9 VDC	666 mA	84 %
TMR 6-1212		12 VDC	500 mA	85 %
TMR 6-1213		15 VDC	400 mA	85 %
TMR 6-1215		24 VDC	250 mA	84 %
TMR 6-1221		±5 VDC	±600 mA	82 %
TMR 6-1222		±12 VDC	±250 mA	83 %
TMR 6-1223		±15 VDC	±200 mA	84 %
TMR 6-2410	**18 – 36 VDC** (24 VDC nominal)	3.3 VDC	1300 mA	78 %
TMR 6-2411		5 VDC	1200 mA	83 %
TMR 6-2419		9 VDC	666 mA	84 %
TMR 6-2412		12 VDC	500 mA	85 %
TMR 6-2413		15 VDC	400 mA	86 %
TMR 6-2415		24 VDC	250 mA	85 %
TMR 6-2421		±5 VDC	±600 mA	82 %
TMR 6-2422		±12 VDC	±250 mA	84 %
TMR 6-2423		±15 VDC	±200 mA	84 %
TMR 6-4810	**36 – 75 VDC** (48 VDC nominal)	3.3 VDC	1300 mA	78 %
TMR 6-4811		5 VDC	1200 mA	82 %
TMR 6-4819		9 VDC	666 mA	84 %
TMR 6-4812		12 VDC	500 mA	85 %
TMR 6-4813		15 VDC	400 mA	86 %
TMR 6-4815		24 VDC	250 mA	84 %
TMR 6-4821		±5 VDC	±600 mA	82 %
TMR 6-4822		±12 VDC	±250 mA	84 %
TMR 6-4823		±15 VDC	±200 mA	85 %

Input Specifications

Input current at no load (nominal input voltage)	5 V models:	**105 mA typ.**
	12 V models:	**55 mA typ.**
	24 V models:	**30 mA typ.**
	48 V models:	**15 mA typ.**
Surge voltage (100 msec. max.)	5 V models:	**15 V max.**
	12 V models:	**36 V max.**
	24 V models:	**50 V max.**
	48 V models:	**100 V max.**
Input filter		**capacitor type**. Application for compliance to EN 55022 class A/B
Recommended input fuse (slow blow, max. rating)	5 V models:	**3.0 A**
	12 V models:	**1.6 A**
	24 V models:	**1.0 A**
	48 V models:	**500 mA**
ESD (electrostatic discharge)		**EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A**
Radiated immunity		**EN 61000-4-3, 10 V/m, perf. criteria A**
Fast transient / surge (with external input capacitor)		**EN 61000-4-4, ±2 kV, perf. criteria A** **EN 61000-4-5, ±2 kV perf. criteria A**
– external input capacitor	5 Vin models:	Nippon chemi-con KY 330 µF, 50 V, ESR 55 mOhm
	other models:	Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm
Conducted immunity		**EN 61000-4-6, 10 Vrms, perf. criteria A**
PF Magnetic Field		**EN 61000-4-8, 100 A/m, perf. criteria A**

Output Specifications

Voltage set accuracy		**±1 % max**
Regulation	– Input variation Vin min. to Vin max.	**0.2 % max.**
	– Load variation 0–100% single out models:	**1.0 % max.**
	dual output models:	**1.0 % max.** balanced load
	– Load cross regulation 25/100%	**5.0 % max.** (dual output models)
Temperature coefficient		**±0.02 %/K**
Minimum load		**not required**
Ripple and noise (20 MHz Bandwidth)		**50 mVp-p max.**
Transient response setting time (25% load step change)		**500 µs typ.**
Short circuit protection		**continuous, automatic recovery**
Start up time	– Power On / Remote On	**10 ms max.**
Capacitive load	3.3 VDC / 5 VDC output models:	**6600 µF max. / 3300 µF max.**
	9 VDC output models:	**2000 µF max.**
	12 VDC / 15 VDC output models:	**1600 µF max. / 1400 µF max.**
	24 VDC output models:	**680 µF max.**
	±5 VDC / ±12 VDC output models:	**±2000 µF max. / ± 900 µF max.**
	±15 VDC output models:	**±660 µF max.**

General Specifications

Temperature ranges	– Operating	**–40°C to +65°C** (without derating)
	– Case temperature	**+105°C max.**
	– Storage	**–55°C to +125°C**
Load derating		**4 %/K above 65°C**
Thermal shock, mechanical shock & vibration	– Test conditions	**EN 61373, MIL-STD-810F**
Humidity (non condensing)		**5 – 95 % rel. H max.**

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

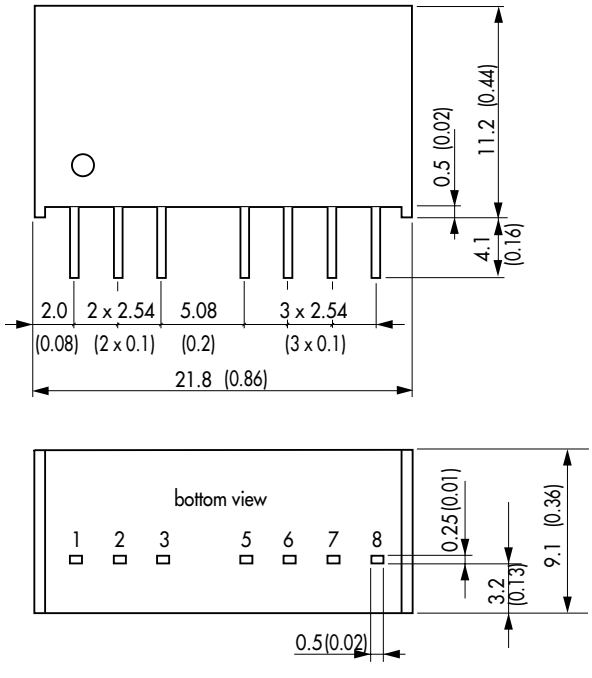
General Specifications

Reliability, calculated MTBF (MIL-HDBK-217F, at +70°C, ground benign)		**>2.1 Mio h**
Isolation voltage (60sec.)	– Input/Output	**1600 VDC**
Isolation capacitance	– Input/Output	**50 pF max.**
Isolation resistance	– Input/Output (500 VDC)	**>1 GOhm**
Switching frequency		**100 kHz min. (PFM)**
Remote On/Off	– On: – Off: – Off stand by input current	**open or high impedance** **2...4 mA current applied via 1KOhm resistor** **2.5 mA max.**
Safety approvals		**UL 60950-1**
Altitude during operation		**4'000 m max.** (13'120 ft) **approved**
Environmental compliance	– Reach – RoHS	**RoHS directive 2011/65/EU**

Physical Specifications

Casing material	**non-conductive plastic**
Potting material	**silicone,** (UL 94V-0 rated)
Weight	**4.8 g** (0.17oz)

Outline Dimensions



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

ntc = not to connect

Dimensions in [mm], () = Inch
Tolerances: ±0.5 (±0.02)
Pin pich tolerances: ±0.25 (±0.01)