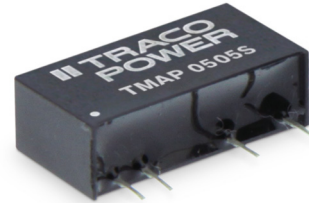


- 1 Watt DC/DC converter in SIP-7-package
- Overload and short circuit protection
- I/O isolation 3'000 VDC (functional)
- Extended operating temperature range -40°C to 85°C without derating
- High efficiency up to 84% typ.
- Industry standard pinout
- 3-year product warranty



The TMAP series is a range of 1 Watt DC/DC converters in compact SIP-7 package with overload and short circuit protection. An excellent efficiency allows these converters to operate up to +85°C without derating. In addition these converters offer a 3'000 VDC I/O isolation. This series is thus suitable for many industrial applications.

Models				
Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TMAP 0505S	4.5 – 5.5 VDC (5 VDC nominal)	5.0 VDC	200 mA	78 %
TMAP 0509S		9.0 VDC	110 mA	81 %
TMAP 0512S		12 VDC	84 mA	82 %
TMAP 0515S		15 VDC	68 mA	83 %
TMAP 0505D		±5.0 VDC	±100 mA	81 %
TMAP 0512D		±12 VDC	±42 mA	81 %
TMAP 0515D		±15 VDC	±34 mA	81 %
TMAP 1205S	10.8 – 13.2 VDC (12 VDC nominal)	5.0 VDC	200 mA	80 %
TMAP 1209S		9.0 VDC	110 mA	82 %
TMAP 1212S		12 VDC	84 mA	84 %
TMAP 1215S		15 VDC	68 mA	83 %
TMAP 1205D		±5.0 VDC	±100 mA	81 %
TMAP 1212D		±12 VDC	±42 mA	82 %
TMAP 1215D		±15 VDC	±34 mA	82 %
TMAP 2405S	21.6 – 26.4 VDC (24 VDC nominal)	5.0 VDC	200 mA	81 %
TMAP 2409S		9.0 VDC	110 mA	79 %
TMAP 2412S		12 VDC	84 mA	82 %
TMAP 2415S		15 VDC	68 mA	82 %
TMAP 2405D		±5.0 VDC	±100 mA	80 %
TMAP 2412D		±12 VDC	±42 mA	81 %
TMAP 2415D		±15 VDC	±34 mA	80 %

## Input Specifications

Input current no load	5 Vin models: 30 mA typ. 12 Vin models: 17 mA typ. 24 Vin models: 10 mA typ.
Surge voltage (1 s max.)	5 Vin models: 9.0 V max. 12 Vin models: 18 V max. 24 Vin models: 30 V max.
Start-up voltage	5 Vin models: 4.5 VDC (or lower) 12 Vin models: 10.8 VDC (or lower) 24 Vin models: 21.6 VDC (or lower)
Input filter	capacitor type
EMC emissions	– Conducted & Radiated input suppression EN 55032 class A or B, FCC part 15 with external components
EMC immunity	– Generic for IT and multimedia applications – ESD (electrostatic discharge) – Radiated immunity – Fast transient / surge (with external input capacitor / diode) – Conducted immunity – Magnetic field immunity EN 55024 EN 61000-4-2, air $\pm 8$ kV, contact $\pm 6$ kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A EN 61000-4-5, $\pm 1$ kV perf. criteria A 5 Vin models: Nippon chemi-con KY 100 $\mu$ F / 25 V and TVS Diode: 1.5KE7V5CA in parallel 12 Vin models: Nippon chemi-con KY 560 $\mu$ F / 50 V and TVS Diode: 1.5KE18CA in parallel 24 Vin models: Nippon chemi-con KY 820 $\mu$ F / 50 V EN 61000-4-6, 10 Vrms, perf. criteria A EN 61000-4-8, 3 A/m, perf. criteria A
External input fuse required (recommended values, slow blow type)	5 Vin models: 500 mA 12 Vin models: 200 mA 24 Vin models: 100 mA

## Output Specifications

Voltage set accuracy	$\pm 1$ % typ. / $\pm 3$ % max.
Voltage balance	dual output models: 0.1 % typ. / 1 % max. (balanced load)
Regulation	– Input variation (for 1% input voltage change) – Load variation (10 – 100 %) 1.2 % typ. / 1.5 % max. 6 to 10 % max. (depending on model)
Minimum load	2 % of rated max. current (operation at lower load condition will not damage these converters, however, they may not meet all listed specifications)
Temperature coefficient	$\pm 0.02$ %/K max.
Ripple and noise (20 MHz Bandwidth)	65 mVp-p typ. / 100 mVp-p max.
Short circuit protection	Continuous, auto recovery (max. short circuit current: 270 % of lout rated)
Capacitive load	single output models: 220 $\mu$ F max. dual output models: 100 $\mu$ F max. (each output)

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

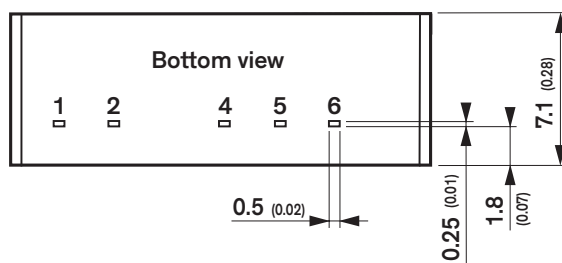
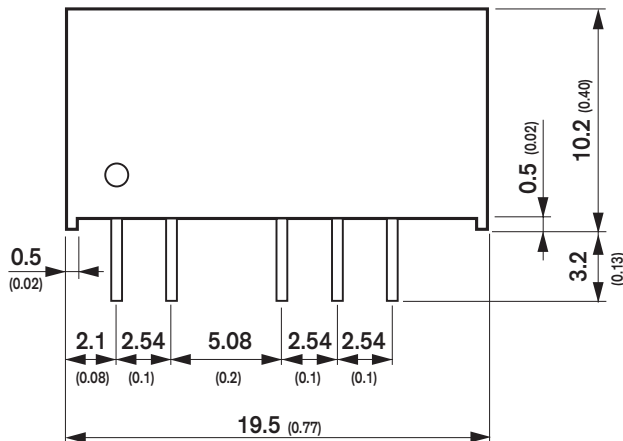
### General Specifications

Temperature ranges	– Operating (natural convection: 20 LFM, 0.1 m/s) – Case temperature – Storage temperature	–40°C to +90°C +95°C max. –50°C to +125°C
Derating		10 %/K above 85°C
Humidity (non condensing)		95 % rel H max.
Isolation voltage (60 s)		3000 VDC (functional)
Isolation capacitance (input to output, at 1 VAC / 100 kHz)		20 pF typ.
Isolation resistance (input to output, at 500 VDC)		10 GOhm min.
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		3'700'000 h
Switching frequency		40 – 110 kHz max.
Environmental compliance	– Reach – RoHS	RoHS directive 2011/65/EU

### Physical Specifications

Casing material	non-conductive black plastic (UL94 V-0)
Pin material	tinned copper
Package weight	3.1 g (0.11 oz)
Soldering temperature	260°C / 10 s max. (1.5 mm from case)

### Outline Dimensions



Standard Pinout		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	–Vin (GND)	–Vin (GND)
4	–Vout	–Vout
5	No Pin	Common
6	+Vout	+Vout

Dimensions in mm (inch)

Tolerances: X.X ±0.5 (±0.02)

X.XX ±0.25 (±0.01)

Pin pitch tolerances: ±0.05 (±0.002)