

- PCB Power module in 1" x 1" package
- Certified to IEC/EN 60335-1 for household appliance
- No load input power <300 mW to comply with ErP directive
- Operating temperature range -25°C to +70°C
- EMI meets EN 55022 class B and EN 55014-1
- Protection class II prepared
- 3-year product warranty



The TMPS-05 series comprises ultra compact AC/DC power supply modules in lightweight fully encapsulated plastic casing for PCB mount. Beside the safety approvals for industrial and IT solutions, they are also certified to IEC/EN 60335-1 for household appliance. These 5 Watt modules are the ideal solution for low power or segregated circuits when space is critical or for an efficient powering of a standby mode when compliance to ErP directive is required. A peak current of 130% facilitates the activation of main circuits.

Models					
Order Code	Output Power max.	Output Voltage nom.	Output Current max.	Output Current peak	Efficiency typ.
TMPS 05-103	5 W	3.3 VDC	1'515 mA	1'970 mA	74 %
TMPS 05-105		5 VDC	1'000 mA	1'300 mA	80 %
TMPS 05-109		9 VDC	555 mA	721 mA	82 %
TMPS 05-112		12 VDC	416 mA	540 mA	82 %
TMPS 05-115		15 VDC	333 mA	433 mA	83 %
TMPS 05-124		24 VDC	208 mA	270 mA	83 %
TMPS 05-148		48 VDC	104 mA	135 mA	85 %

### Input Specifications

Input Voltage	- AC Range	85 - 264 VAC (Full Range)
	- DC Range	120 - 370 VDC (Designed for, no certification)
Input Frequency		47 - 63 Hz
Power Consumption	- At no load	300 mW max. (Ready to meet ErP directive)
Input Inrush Current	- At 230 VAC	40 A max.
	- At 115 VAC	20 A max.
Input Protection		T 1.0 A / 250 V
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

### Output Specifications

Voltage Set Accuracy		±2% max.
Regulation	- Input Variation (Vmin - Vmax)	1% max.
	- Load Variation (0 - 100%)	1% max.
Output Current peak		<30 s with maximum duty cycle of 10%, average output power must not exceed 5 W
Ripple and Noise (20 MHz Bandwidth)	3.3 VDC model:	60 mVp-p max.
	5 VDC model:	60 mVp-p max.
	9 VDC model:	90 mVp-p max.
	12 VDC model:	120 mVp-p max.
	15 VDC model:	150 mVp-p max.
	24 VDC model:	240 mVp-p max.
Capacitive Load	48 VDC model:	480 mVp-p max.
	3.3 VDC model:	2'200 µF max.
	5 VDC model:	1'000 µF max.
	9 VDC model:	300 µF max.
	12 VDC model:	160 µF max.
	15 VDC model:	100 µF max.
24 VDC model:	43 µF max.	
48 VDC model:	10 µF max.	
Minimum Load		Not required
Temperature Coefficient		±0.05 %/K max.
Start-up Time	- At 230 VAC	200 ms max.
	- At 115 VAC	200 ms max.
Start-up Overshoot Voltage		5% max.
Short Circuit Protection		Continuous, Automatic recovery
Overload Protection		Foldback Mode
Output Current Limitation		135% min. of Iout max.
		150% typ. of Iout max.
Overvoltage Protection		125% typ. of Vout nom.
		190% max. of Vout nom. (By Zener diode)

### Safety Specifications

Safety Standards	- IT / Multimedia Equipment	CSA-C22.2, No 60950-1 EN 60950-1 IEC 60950-1 UL 60950-1
	- Household	EN 60335-1 IEC 60335-1
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmps05">www.tracopower.com/overview/tmps05</a>
Protection Class		Class II (Prepared): Reinforced Insulation
Pollution Degree		PD 2
Over Voltage Category		OVC II

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

## EMC Specifications

<b>EMI Emissions</b>		EN 61204-3 (Low Voltage Power Supplies)
- Conducted Emissions		EN 55014-1 (internal filter)
		EN 55032 class B (internal filter)
		FCC Part 15 class B (internal filter)
- Radiated Emissions		EN 55014-1 (internal filter)
		EN 55032 class B (internal filter)
		FCC Part 15 class B (internal filter)
- Harmonic Current Emissions		EN 61000-3-2
- Voltage Fluctuations & Flicker		EN 61000-3-3
<b>EMS Immunity</b>		EN 55024 (IT Equipment)
		EN 55014-2 (Household Appliances Tools)
- Electrostatic Discharge	Air:	EN 61000-4-2, $\pm 8$ kV, perf. criteria A
	Contact:	EN 61000-4-2, $\pm 4$ kV, perf. criteria A
- RF Electromagnetic Field		EN 61000-4-3, 10 V/m, perf. criteria A
- EFT (Burst) / Surge		EN 61000-4-4, $\pm 2$ kV, perf. criteria A
	L to L:	EN 61000-4-5, $\pm 1$ kV, perf. criteria A
- Conducted RF Disturbances		EN 61000-4-6, 10 Vrms, perf. criteria A
- PF Magnetic Field	Continuous:	EN 61000-4-8, 30 A/m, perf. criteria A
- Voltage Dips & Interruptions	230 VAC / 50 Hz:	EN 61000-4-11
		30%, 25 periods, perf. criteria A
		60%, 5 periods, perf. criteria A
		>95%, 0.5 periods, perf. criteria A
		>95%, 250 periods, perf. criteria B

## General Specifications

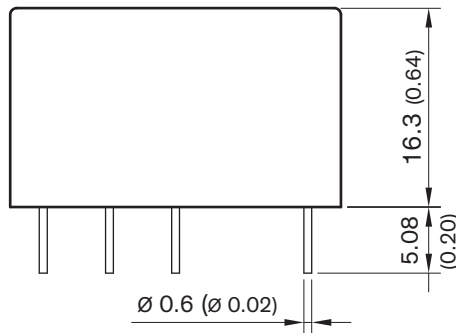
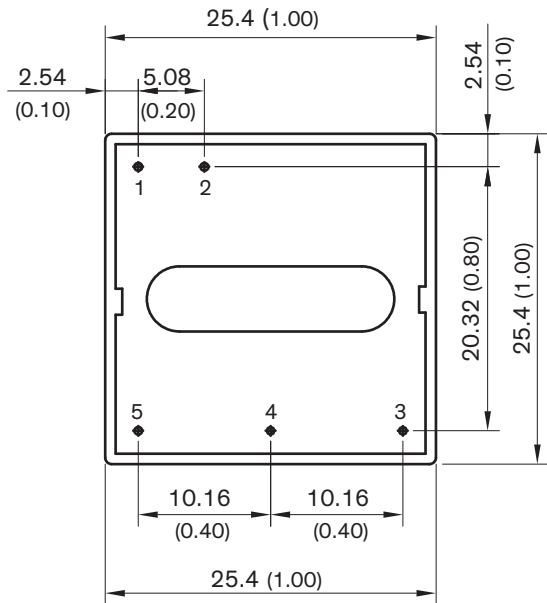
<b>Relative Humidity</b>		95% max. (non condensing)
<b>Temperature Ranges</b>	- Operating Temperature	-25°C to +70°C
	- Storage Temperature	-40°C to +85°C
<b>Power Derating</b>	- High Temperature	2.5 %/K above 50°C
<b>Cooling System</b>		Natural convection (20 LFM)
<b>Altitude During Operation</b>		2'000 m max.
<b>Switching Frequency</b>		49 - 81 kHz (PWM)
		65 kHz typ. (PWM)
<b>Insulation System</b>		Reinforced Insulation
<b>Working Voltage (rated)</b>		250 VAC
<b>Isolation Test Voltage</b>	- Input to Output, 60 s	3'000 VAC
<b>Isolation Resistance</b>	- Input to Output, 500 VDC	100 M $\Omega$ min.
<b>Reliability</b>	- Calculated MTBF	520'000 h (MIL-HDBK-217F, ground benign)
<b>Housing Material</b>		Plastic resin (UL 94 V-0 rated)
<b>Pin Material</b>		Copper (C6804)
<b>Pin Foundation Plating</b>		Nickel (2 - 4 $\mu$ m)
<b>Pin Surface Plating</b>		Tin (3 - 5 $\mu$ m), matte
<b>Soldering Profile</b>		Wave Soldering
		260°C / 10 s
<b>Connection Type</b>		THD (Through-Hole Device)
<b>Weight</b>		19.7 g
<b>Environmental Compliance</b>	- Reach	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a>
	- RoHS	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a>

## Supporting Documents

<b>Overview Link</b> (for additional Documents)	<a href="http://www.tracopower.com/overview/tmps05">www.tracopower.com/overview/tmps05</a>
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**Outline Dimensions**



Dimensions in mm (inch)  
 Outside dimension tolerance:  $\pm 0.5$  ( $\pm 0.02$ )  
 Pin pitch tolerance:  $\pm 0.25$  ( $\pm 0.01$ )  
 Pin diameter:  $\text{Ø } 0.6 \pm 0.1$  ( $\pm 0.004$ )

Pin Connections	
Pin	Function
1	AC (N)
2	AC (L)
3	NC*
4	-Vout
5	+Vout

\*Internally not connected but keep it isolated from primary circuit