

- 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 55032 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	Operational Range: <b>85 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>120 - 370 VDC</b> (Designed for, no certification) Polarity: <b>irrelevant</b>
Input Frequency		Operational Range: <b>47 - 63 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC	<b>750 mW max.</b>
	- No load & Vin = 115 VAC	<b>300 mW max.</b>
Input Inrush Current	- At 230 VAC	<b>40 A max.</b>
	- At 115 VAC	<b>20 A max.</b>
Input Protection		<b>T 1.0 A / 250 V</b>
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

### Output Specifications

Voltage Set Accuracy		<b>±2% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	<b>1% max.</b>
	- Load Variation (0 - 100%)	<b>1% max.</b>
Boost Power		Output Current peak: See model table Peak power time: <b>30 s max.</b> Peak power duty cycle: <b>10% max.</b> Average operation power: <b>5 W max.</b>
Ripple and Noise (20 MHz Bandwidth)	3.3 VDC model:	<b>60 mVp-p max.</b>
	5 VDC model:	<b>60 mVp-p max.</b>
	9 VDC model:	<b>90 mVp-p max.</b>
	12 VDC model:	<b>120 mVp-p max.</b>
	15 VDC model:	<b>150 mVp-p max.</b>
	24 VDC model:	<b>240 mVp-p max.</b>
	48 VDC model:	<b>480 mVp-p max.</b>
Capacitive Load	3.3 VDC model:	<b>2'200 µF max.</b>
	5 VDC model:	<b>1'000 µF max.</b>
	9 VDC model:	<b>300 µF max.</b>
	12 VDC model:	<b>160 µF max.</b>
	15 VDC model:	<b>100 µF max.</b>
	24 VDC model:	<b>43 µF max.</b>
48 VDC model:	<b>10 µF max.</b>	
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.05 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>40 ms min.</b>
	- At 115 VAC	<b>8 ms min.</b>
Start-up Time	- At 230 VAC	<b>200 ms max.</b>
	- At 115 VAC	<b>200 ms max.</b>
Start-up Overshoot Voltage		<b>5% max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>135% min. of Iout max.</b>
		<b>150% typ. of Iout max.</b>
Overvoltage Protection		<b>125% typ. of Vout nom.</b>
		<b>190% max. of Vout nom.</b>
		(By Zener diode)

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

### Safety Specifications

Standards	- IT / Multimedia Equipment	CSA-C22.2, No. 60950-1 EN 60950-1 EN 62368-1 IEC 60950-1 UL 60950-1 UL 62368-1
	- 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 I & II (Prepared); Reinforced Insulation
Pollution Degree		PD 2
Over Voltage Category		OVC II

### EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 61204-3 (Low Voltage Power Supplies) EN 55014-1 (internal filter) EN 55032 class B (internal filter) FCC 47 Part 15 class B (internal filter)
	- Radiated Emissions	EN 55014-1 (internal filter) EN 55032 class B (internal filter) FCC 47 Part 15 class B (internal filter)
	- Harmonic Current Emissions	EN 61000-3-2
	- Voltage Fluctuations & Flicker	EN 61000-3-3
EMS (Immunity)	- Electrostatic Discharge	EN 55024 (IT Equipment) EN 55035 (Multimedia) EN 55014-2 (Household Appliances Tools) Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria A EN 61000-4-6, 10 Vrms, perf. criteria A
	- RF Electromagnetic Field	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A
	- EFT (Burst) / Surge	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
	- Conducted RF Disturbances	
	- PF Magnetic Field	
	- Voltage Dips & Interruptions	
EMC / Environmental	- Certification Documents	<a href="http://www.tracopower.com/overview/tmps05">www.tracopower.com/overview/tmps05</a>

### General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-25°C to +70°C
	- Storage Temperature	-40°C to +85°C
Power Derating	- High Temperature	2.5 %/K above 50°C
		See application note: <a href="http://www.tracopower.com/overview/tmps05">www.tracopower.com/overview/tmps05</a>
Cooling System		Natural convection (20 LFM)
Altitude During Operation		4'000 m max.
Switching Frequency		49 - 81 kHz (PWM) 65 kHz typ. (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		250 VAC
Isolation Test Voltage	- Input to Output, 60 s	3'000 VAC
Isolation Resistance	- Input to Output, 500 VDC	100 M $\Omega$ min.
Reliability	- Calculated MTBF	520'000 h (MIL-HDBK-217F, ground benign)

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

Washing Process	Not allowed
Housing Material	Plastic resin (UL 94 V-0 rated)
Potting Material	Silicone (UL 94 V-0 rated)
Pin Material	Copper Alloy (C6801)
Pin Foundation Plating	Nickel (2 - 4 µm)
Pin Surface Plating	Tin (3 - 5 µm), matte
Housing Type	Plastic Case
Mounting Type	PCB Mount
Connection Type	THD (Through-Hole Device)
Soldering Profile	Lead-Free Wave Soldering 260°C / 10 s max.
Weight	19.7 g
Environmental Compliance	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule)) 6717d03d-695f-4e4e-8ca0-4034ab23db57
	- REACH Declaration
	- RoHS Declaration
	- SCIP Reference Number

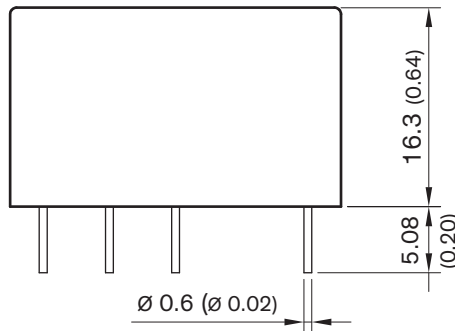
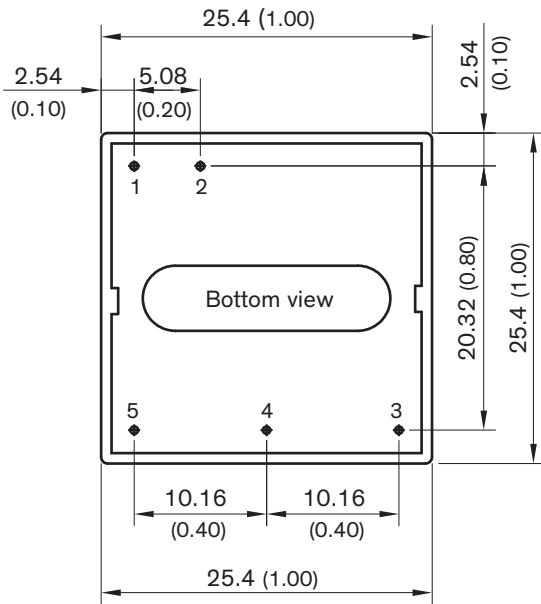
## Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tmps05](http://www.tracopower.com/overview/tmps05)

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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	NTC
4	-Vout
5	+Vout

NTC: Not to connect