TRACO POWER

AC/DC Power Supply

TMPS 05 Series, 5 Watt

- **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**

UL 62368-1 IEC 60335-1
IEC 60950-1

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		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	5 W	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:	85 - 264 VAC (Full Range)
		Rated Range:	100 - 240 VAC (Full Range)
	- DC Range	Operational Range:	120 - 370 VDC (Designed for, no certification)
		Polarity:	irrelevant
Input Frequency		Operational Range:	47 - 63 Hz
		Certified:	50/60 Hz
Power Consumption	- No load & Vin = 230 VAC		750 mW max.
	- No load & Vin = 115 VAC		300 mW max.
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.
Boost Power			Output Current peak: See model table Peak power time: 30 s max. Peak power duty cycle: 10% max. Average operation power: 5 W max.
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.
		48 VDC model:	480 mVp-p max.
Capacitive Load		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.
Hold-up Time	- At 230 VAC		40 ms min.
	- At 115 VAC		8 ms min.
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
Output Current Limitation			135% min. of Iout max. 150% typ. of Iout max.
Overvoltage Protection			190% max. of Vout nom. (By Zener diode) 125% typ. of Vout nom. (By Zener diode)

All specifications valid at 230 VAC, 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		www.tracopower.com/tmps05-safety-cert
Protection Class			Class I & II (Prepared): Reinforced Insulation
		See application note:	www.tracopower.com/info/protection-class.pdf
Pollution Degree			PD 2
Over Voltage Category			OVC II

EMC Specifications

EMI (Emissions)			EN 61204-3 (Low Voltage Power Supplies)
	- Conducted Emissions		EN 55014-1 (internal filter) EN 55032 class A (internal filter) EN 55032 class B (internal filter) FCC 47 Part 15 class A (internal filter) FCC 47 Part 15 class B (internal filter)
	- Radiated Emissions		EN 55014-1 (internal filter) EN 55032 class A (internal filter) EN 55032 class B (internal filter) FCC 47 Part 15 class A (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)			EN 55024 (IT Equipment) EN 55035 (Multimedia) EN 55014-2 (Household Appliances Tools)
	- Electrostatic Discharge	Air:	EN 61000-4-2, ±8 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±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, ±2 kV, perf. criteria A
		L to L:	EN 61000-4-5, ±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
EMC / Environmental	- Certification Documents		www.tracopower.com/tmps05-emc-cert

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:	www.tracopower.com/tmps05-cc
Cooling System			Natural convection (20 LFM)
Altitude During Operation			4'000 m max.
Switching Frequency			49 - 81 kHz (PWM) 65 kHz typ. (PWM)

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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 MΩ min.
Reliability	- Calculated MTBF	520'000 h (MIL-HDBK-217F, ground benign)
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	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7(a), 7(c)-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	6717d03d-695f-4e4e-8ca0-4034ab23db57

Additional Information

Supporting Documents	www.tracopower.com/overview/tmps05
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf

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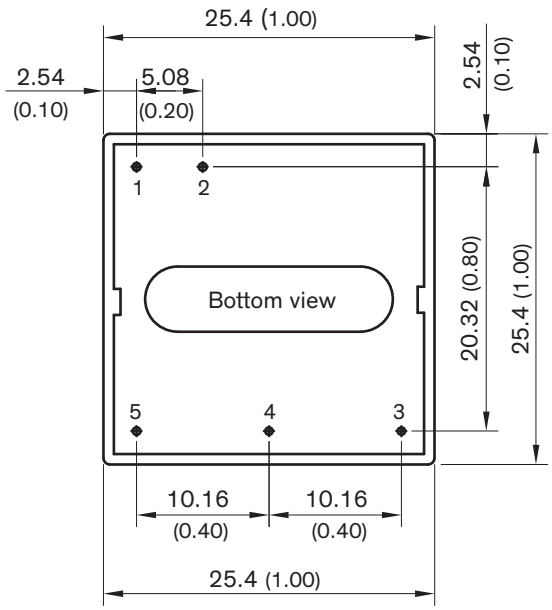
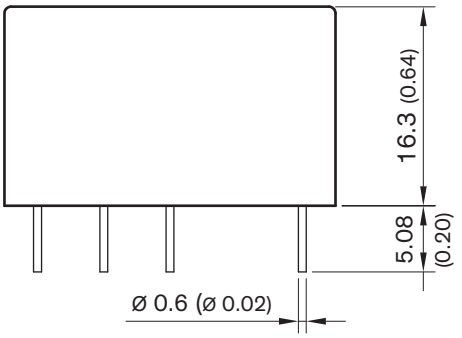
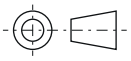
Outline Dimensions





Dimensions in mm (inch)
Outside dimension tolerance: ±0.5 (±0.02)
Pin pitch tolerance: ±0.25 (±0.01)
Pin diameter: Ø 0.6 ±0.1 (±0.004)



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

NTC: Not to connect

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- Alternative Solution
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