



# THE DATASHEET OF TMPS 10-109



- Ultra Compact 10 Watt PCB Power module in 1" x 1.5" package
- Certified to IEC/EN 60335-1 and UL 62368-1 for household and industrial appliance
- Reinforced I/O isolation 4000 VAC
- Operating temperature range -25°C to +70°C
- Allows 130% peak current up to 30 s
- Ready to meet ErP directive, < 0.15 W no load power consumption
- EMI meets EN 55032 class B and EN 55014-1
- Protection class II prepared
- 3-year product warranty



The TMPS 10 series comprises ultra compact AC/DC power supply modules in a lightweight fully encapsulated plastic casing for PCB mount. Beside the latest safety approvals for industrial and IT solutions (IEC/EN/UL 62368-1), they are also certified to IEC/EN 60335-1 for household appliance. These 10 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 10-103	10 W	3.3 VDC	2'600 mA	3'380 mA	77 %
TMPS 10-105		5 VDC	2'000 mA	2'600 mA	80 %
TMPS 10-109		9 VDC	1'100 mA	1'440 mA	83 %
TMPS 10-112		12 VDC	830 mA	1'080 mA	84 %
TMPS 10-115		15 VDC	660 mA	860 mA	84 %
TMPS 10-124		24 VDC	410 mA	530 mA	86 %
TMPS 10-148		48 VDC	210 mA	270 mA	84 %

### 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 - 440 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC	<b>450 mW max.</b>
	- No load & Vin = 115 VAC	<b>150 mW max.</b>
Input Inrush Current	- At 230 VAC	<b>40 A max.</b>
	- At 115 VAC	<b>20 A max.</b>
Recommended Input Fuse		<b>1'600 mA</b> (slow blow) (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>0.5% max.</b>
	- Load Variation (0 - 100%)	<b>1% max.</b>
Boost Power		Output Current peak: See model table Peak power time: 30 s max. Peak power duty cycle: 10% max. Average operation power: 10 W max.
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>
Capacitive Load	3.3 VDC model:	<b>4'400 µF max.</b>
	5 VDC model:	<b>2'200 µF max.</b>
	9 VDC model:	<b>680 µF max.</b>
	12 VDC model:	<b>390 µF max.</b>
	15 VDC model:	<b>240 µF max.</b>
	24 VDC model:	<b>100 µF max.</b>
48 VDC model:	<b>24 µF max.</b>	
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>40 ms min.</b>
	- At 115 VAC	<b>8 ms min.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>150% typ. of Iout max.</b>
Overvoltage Protection		<b>125% typ. of Vout nom.</b> (By Zener diode)

### Safety Specifications

Standards	- IT / Multimedia Equipment	<b>EN 62368-1</b> <b>IEC 62368-1</b> <b>UL 62368-1</b>
	- Household	<b>EN 60335-1</b> <b>IEC 60335-1</b>
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmps10">www.tracopower.com/overview/tmps10</a>
Protection Class		<b>Class I &amp; II (Prepared): Reinforced Insulation</b>

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

Pollution Degree	PD 2
Over Voltage Category	OVC II

### EMC Specifications

EMI Emissions	- 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
EMS Immunity		EN 55024 (IT Equipment) EN 55035 (Multimedia) EN 55014-2 (Household Appliances Tools)
	- Electrostatic Discharge	Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A
	- RF Electromagnetic Field	L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria A EN 61000-4-6, 10 Vrms, perf. criteria A
	- EFT (Burst) / Surge	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A EN 61000-4-11 30%, 25 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	230 VAC / 50 Hz:

### General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-25°C to +70°C
	- Approved Ambient Temp.	+50°C max.
	- Case Temperature	+95°C max.
	- 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/tmps10">www.tracopower.com/overview/tmps10</a>
Cooling System		Natural convection (20 LFM)
Altitude During Operation		2'000 m max.
Switching Frequency		30 - 65 kHz (PWM)
		45 kHz typ. (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		244 VAC
Isolation Test Voltage	- Input to Output, 60 s	4'000 VAC
Isolation Resistance	- Input to Output, 500 VDC	1'000 M $\Omega$ min.
Leakage Current	- Touch Current	250 $\mu$ A max.
Reliability	- Calculated MTBF	453'000 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 $\mu$ m)
Pin Surface Plating		Tin (3 - 5 $\mu$ m), 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.

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

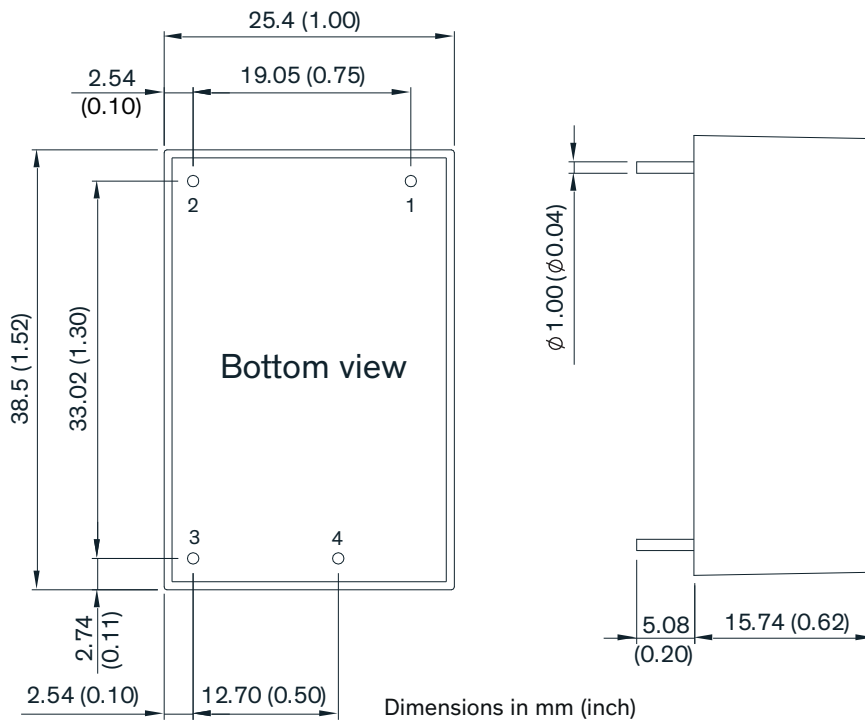
Weight	29 g
Environmental Compliance - REACH Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant
- RoHS Declaration	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
- SCIP Reference Number	ff22f0cd-e618-4e40-a6d5-fcf29f17a993

### Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tmps10](http://www.tracopower.com/overview/tmps10)

### Outline Dimensions





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

Dimensions in mm (inch)  
 Outside dimension tolerance:  $\pm 0.5$  ( $\pm 0.02$ )  
 Pin pitch tolerance:  $\pm 0.25$  ( $\pm 0.01$ )  
 Pin diameter  $\varnothing$ :  $1.0 \pm 0.1$  ( $0.04 \pm 0.004$ )

## Looking for pricing, stock, or lifecycle information?

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-  [Traco Power Information](#)

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