

## AC/DC Power Supply

## TMPW 10 Series, 10 Watt

- Compact PCB power module in 1.46" x 1.08" package
- Wide input voltage range 90-305 VAC
- Certified according to EN 60335-1 and IEC/EN/UL 62368-1
- I/O-Isolation 4'000 VAC
- Operating temperature range -40°C to +70°C
- No load input power <0.1W (acc. ErP directive)
- High efficiency up to 86%
- Internal EN 55032 class B filter
- Protection class II prepared
- 3-year product warranty



UL 62368-1 IEC 60335-1

IEC 62368-1

The TMPW 10 is a 10 Watt AC/DC series with an extended input range of 90-305 VAC and is suitable for industrial and household/building technology applications and comes in a compact encapsulated plastic case. The 305 VAC (277 VAC  $\pm 10\%$ ) threshold is derived from a 480 VAC three-phase supply voltage often used in heavy industrial applications. Through the increased voltage level, the drawn current from the load is effectively reduced, which allows for an overall more compact and lightweight design approach. They offer an I/O-isolation voltage of 4000 VAC, a high temperature range of -40 to +70°C and are prepared for protection class II applications. Additionally, an internal EN 55032 class B filter saves valuable board space for an otherwise often mandatory external filter setup. An energy efficient design (<0.1 Watt standby power consumption) and safety approvals according to IEC/EN/UL 62368-1 and EN 60335-1 make this series suitable for a wide range of industrial and household/building technology applications.

### Models

Order Code	Output Power max.	Output Voltage nom.	Output Current max.	Efficiency typ.
<b>TMPW 10-105</b>		5 VDC	2'000 mA	81 %
<b>TMPW 10-112</b>		12 VDC	833 mA	85 %
<b>TMPW 10-115</b>	10 W	15 VDC	667 mA	86 %
<b>TMPW 10-124</b>		24 VDC	417 mA	86 %

## Input Specifications

Input Voltage	- AC Range	Operational Range: <b>90 - 305 VAC</b> (Full Range) Rated Range: <b>100 - 277 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>100 - 430 VDC</b> Certified Range: <b>100 - 250 VDC</b> Polarity: <b>+DC: N / -DC: L</b> (The rated range refers to 62368-1. For 60335-1 certification the rated input voltage is 100 - 240 VAC and DC input is not permitted.)
Input Frequency		Operational Range: <b>47 - 440 Hz</b> Certified: <b>50/60 Hz</b>
Input Current	- Full Load & Vin = 230 VAC - Full Load & Vin = 115 VAC	<b>140 mA max.</b> <b>230 mA max.</b>
Power Consumption	- No load & Vin = 230 VAC - No load & Vin = 115 VAC	<b>100 mW max.</b> (Ready to meet ErP directive) <b>100 mW max.</b>
Input Inrush Current	- At 230 VAC - At 115 VAC	<b>60 A max.</b> <b>30 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>0.2% max.</b>
	- Load Variation (0 - 100%)	<b>1% max.</b> (5 & 12 Vout models) <b>0.5 % max.</b> (other models)
Ripple and Noise (20 MHz Bandwidth)	5 VDC model:	<b>60 mVp-p max.</b> (w/ 0.1 µF    47 µF)
	12 VDC model:	<b>120 mVp-p max.</b> (w/ 0.1 µF    47 µF)
	15 VDC model:	<b>150 mVp-p max.</b> (w/ 0.1 µF    47 µF)
	24 VDC model:	<b>240 mVp-p max.</b> (w/ 0.1 µF    47 µF)
Capacitive Load	5 VDC model:	<b>3'500 µF max.</b>
	12 VDC model:	<b>700 µF max.</b>
	15 VDC model:	<b>390 µF max.</b>
	24 VDC model:	<b>180 µF max.</b>
Minimum Load	<b>Not required</b>	
Temperature Coefficient	<b>±0.02 %/K max.</b>	
Hold-up Time	- At 230 VAC	<b>30 ms min.</b>
Start-up Time	- At 230 VAC	<b>60 ms max.</b>
	- At 115 VAC	<b>60 ms max.</b>
Short Circuit Protection	<b>Continuous, Automatic recovery</b>	
Output Current Limitation	<b>140 - 235% of Iout max.</b>	
Overvoltage Protection	<b>105 - 145% of Vout nom.</b> (By Zener diode)	
Transient Response	- Response Deviation	<b>2% typ. / 3% max.</b> (50% to 75% Load Step)
	- Response Time	<b>500 µs max.</b> (50% to 75% Load Step)

## Safety Specifications

Standards	- IT / Multimedia Equipment	<b>EN 62368-1</b>
	- Household	<b>IEC 62368-1</b>
	- Power Transformers	<b>UL 62368-1</b>
	- Certification Documents	<b>EN 60335-1</b>
		<b>IEC 60335-1</b>
		<b>IEC 61558-1</b>
		<b>IEC 61558-2-16</b>
		<a href="http://www.tracopower.com/overview/tmpw10">www.tracopower.com/overview/tmpw10</a>

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

Protection Class	Class I & II (Prepared): Reinforced Insulation
Pollution Degree	PD 2
Over Voltage Category	OVC II

## EMC Specifications

EMI Emissions	- Conducted Emissions - Radiated Emissions - Harmonic Current Emissions - Voltage Fluctuations & Flicker	EN 55032 class B (internal filter) EN 55032 class B (internal filter) EN 61000-3-2, class A EN 61000-3-3
EMS Immunity		EN 61000-6-2 (Generic Industrial) EN 55024 (IT Equipment) EN 55035 (Multimedia)
	- Electrostatic Discharge	Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A
	- RF Electromagnetic Field	Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A
	- Conducted RF Disturbances	L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria A
	- PF Magnetic Field	EN 61000-4-6, 10 Vrms, perf. criteria A
	- Voltage Dips & Interruptions	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A
		230 VAC / 50 Hz: EN 61000-4-11 30%, 25 periods, perf. criteria A 60%, 10 periods, perf. criteria A $>95\%$ , 0.5 periods, perf. criteria A $>95\%$ , 250 periods, perf. criteria B 100%, 0.5 periods, perf. criteria A 100%, 1 period, perf. criteria A 100%, 250 periods, perf. criteria B
		115 VAC / 60 Hz: EN 61000-4-11 30%, 25 periods, perf. criteria A 60%, 10 periods, perf. criteria A $>95\%$ , 0.5 periods, perf. criteria A $>95\%$ , 250 periods, perf. criteria B 100%, 0.5 periods, perf. criteria A 100%, 1 period, perf. criteria A 100%, 250 periods, perf. criteria B

## General Specifications

Relative Humidity	95% max. (non condensing)
Temperature Ranges	-40°C to +70°C -40°C to +85°C (Max. operating temperature must be derated by 3.5°C / 1'000 m above 2'000 m)
Power Derating	- High Temperature - Low Input Voltage 2.5 %/K above 50°C 2 %/V below 100 VAC See application note: <a href="http://www.tracopower.com/overview/tmpw10">www.tracopower.com/overview/tmpw10</a>
Cooling System	Natural convection (20 LFM)
Altitude During Operation	5'000 m max. (acc. IEC 62368-1) 2'000 m max. (acc. IEC 60335-1)
Switching Frequency	35 - 75 kHz (PWM, PFM)
Insulation System	Reinforced Insulation
Working Voltage (rated)	254 VAC
Isolation Test Voltage	- Input to Output, 60 s 4'000 VAC
Leakage Current	- Touch Current 250 $\mu$ A max.
Reliability	- Calculated MTBF 450'000 h (MIL-HDBK-217F, ground benign)
Washing Process	Not allowed

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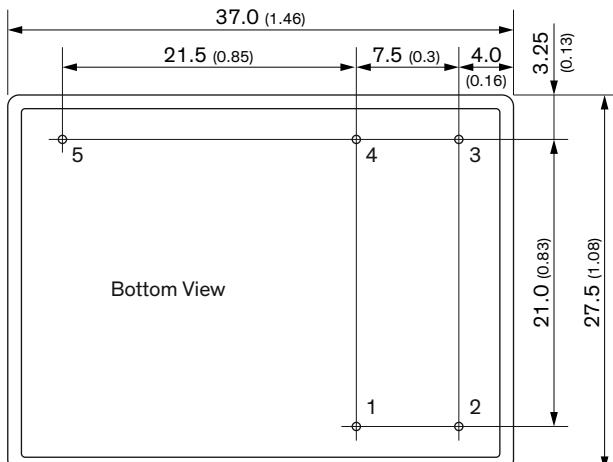
Environment	- Vibration	IEC 60068-2-6 2 g, 3 axis, 60 min, 10-500 Hz, 10 min/cycle
	- Mechanical Shock	IEC 60068-2-27
Housing Material		Plastic resin (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated) (Hermetical sealed structure, dust-proof only non water-proof)
Pin Material		Brass
Pin Surface Plating		Tin (120 µm min.), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Soldering Profile		Lead-Free Wave Soldering 270°C / 3 s max.
Weight		31 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 <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a>
	- RoHS Declaration	<b>Exemptions: 7c-l</b> (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	<b>4a581b31-098c-465a-86ad-c16eed37056d</b>

## Supporting Documents

Overview Link (for additional Documents)

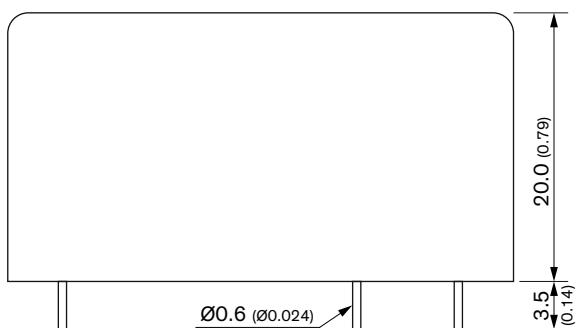
[www.tracopower.com/overview/tmpw10](http://www.tracopower.com/overview/tmpw10)

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**Outline Dimensions**

<b>Pinout</b>	
<b>Pin</b>	<b>Single</b>
<b>1</b>	+Vout
<b>2</b>	-Vout
<b>3</b>	AC IN (L)
<b>4</b>	AC IN (N)
<b>5</b>	NC

NC: Not connected



Dimensions in mm (inch)  
Tolerances: x.x  $\pm 0.5$  ( $\pm 0.02$ )