AC/DC Power Supply

- 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.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>TMPS 05-103</td>
<td>5 W</td>
<td>3.3 VDC</td>
<td>1'515 mA</td>
<td>1'970 mA</td>
<td>74 %</td>
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<tr>
<td>TMPS 05-105</td>
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<td>5 VDC</td>
<td>1'000 mA</td>
<td>1'300 mA</td>
<td>80 %</td>
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<tr>
<td>TMPS 05-109</td>
<td></td>
<td>9 VDC</td>
<td>555 mA</td>
<td>721 mA</td>
<td>82 %</td>
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<tr>
<td>TMPS 05-112</td>
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<td>12 VDC</td>
<td>416 mA</td>
<td>540 mA</td>
<td>82 %</td>
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<tr>
<td>TMPS 05-115</td>
<td></td>
<td>15 VDC</td>
<td>333 mA</td>
<td>433 mA</td>
<td>83 %</td>
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<tr>
<td>TMPS 05-124</td>
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<td>24 VDC</td>
<td>208 mA</td>
<td>270 mA</td>
<td>83 %</td>
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<tr>
<td>TMPS 05-148</td>
<td></td>
<td>48 VDC</td>
<td>104 mA</td>
<td>135 mA</td>
<td>85 %</td>
</tr>
</tbody>
</table>
### 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.
- 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 °C/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
- Household: EN 60950-1
- Certification Documents: IEC 60950-1
- UL 60950-1
- EN 60335-1
- IEC 60335-1

**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.
EMI Emissions
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

EMS Immunity
EN 55024 (IT Equipment)
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
  L to L: EN 61000-4-5, ±1 kV, perf. criteria A
  Continuous: EN 61000-4-6, 10 Vrms, perf. criteria A
- PF Magnetic Field
- 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
Relative Humidity
95% max. (non condensing)
Temperature Ranges
- Operating Temperature
  -25°C to +70°C
- Storage Temperature
  -40°C to +85°C
Power Derating
2.5 %/K above 50°C
Cooling System
Natural convection (20 LFM)
Altitude During Operation
2'000 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 MΩ min.
Reliability
- Calculated MTBF
  520'000 h (MIL-HDBK-217F, ground benign)
Housing Material
Plastic resin (UL 94 V-0 rated)
Pin Material
Copper (C8804)
Pin Foundation Plating
Nickel (2 - 4 µm)
Pin Surface Plating
Tin (3 - 5 µm), matte
Soldering Profile
Wave Soldering
260°C / 10 s
Connections Type
THD (Through-Hole Device)
Weight
19.7 g
Environmental Compliance
- Reach
  www.tracopower.com/info/reach-declaration.pdf
- RoHS
  www.tracopower.com/info/rohs-declaration.pdf

Supporting Documents
Overview Link (for additional Documents)
www.tracopower.com/overview/tmps05

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

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC (N)</td>
</tr>
<tr>
<td>2</td>
<td>AC (L)</td>
</tr>
<tr>
<td>3</td>
<td>NC*</td>
</tr>
<tr>
<td>4</td>
<td>–Vout</td>
</tr>
<tr>
<td>5</td>
<td>+Vout</td>
</tr>
</tbody>
</table>

*Internally not connected but keep it isolated from primary circuit

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)