

- 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)<br>Rated Range: <b>100 - 240 VAC</b> (Full Range)   |
|                        | - DC Range                | Operational Range: <b>120 - 370 VDC</b> (Designed for, no certification)<br>Polarity: <b>irrelevant</b> |
| Input Frequency        |                           | Operational Range: <b>47 - 63 Hz</b><br>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<br>Peak power time: 30 s max.<br>Peak power duty cycle: 10% max.<br>Average operation power: 5 W max. |
| Ripple and Noise<br>(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>  |
| Overload Protection                    |                                 | <b>Foldback Mode</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><br>(By Zener diode)  |

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

### Safety Specifications

|                       |                             |   |
|-----------------------|-----------------------------|---|
| Safety Standards      | - IT / Multimedia Equipment | CSA-C22.2, No. 60950-1<br>EN 60950-1<br>EN 62368-1<br>IEC 60950-1<br>UL 60950-1<br>UL 62368-1 |
|                       | - Household                 | EN 60335-1<br>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)<br>EN 55014-1 (internal filter)<br>EN 55032 class B (internal filter)<br>FCC Part 15 class B (internal filter)   |
|               | - Radiated Emissions             | EN 55014-1 (internal filter)<br>EN 55032 class B (internal filter)<br>FCC 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)<br>EN 55035 (Multimedia)<br>EN 55014-2 (Household Appliances Tools)<br>Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A<br>Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A<br>EN 61000-4-3, 10 V/m, perf. criteria A<br>EN 61000-4-4, $\pm 2$ kV, perf. criteria A<br>L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria A<br>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<br>30%, 25 periods, perf. criteria A<br>60%, 5 periods, perf. criteria A<br>>95%, 0.5 periods, perf. criteria A<br>>95%, 250 periods, perf. criteria B  |
|               | - Conducted RF Disturbances      |  |
|               | - PF Magnetic Field              |  |
|               | - Voltage Dips & Interruptions   |  |

### 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)<br>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)   |
| Washing Process           |                            | Not allowed  |

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

|                          |   |
|--------------------------|---|
| 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<br>260°C / 10 s max.   |
| Weight                   | 19.7 g  |
| Environmental Compliance | <p>- REACH Declaration <a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a></p> <p>REACH SVHC list compliant<br/>REACH Annex XVII compliant</p> <p>- RoHS Declaration <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a></p> <p>Exemptions: 7a, 7c-I<br/>(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))</p> <p>- SCIP Reference Number <b>6717d03d-695f-4e4e-8ca0-4034ab23db57</b></p> |

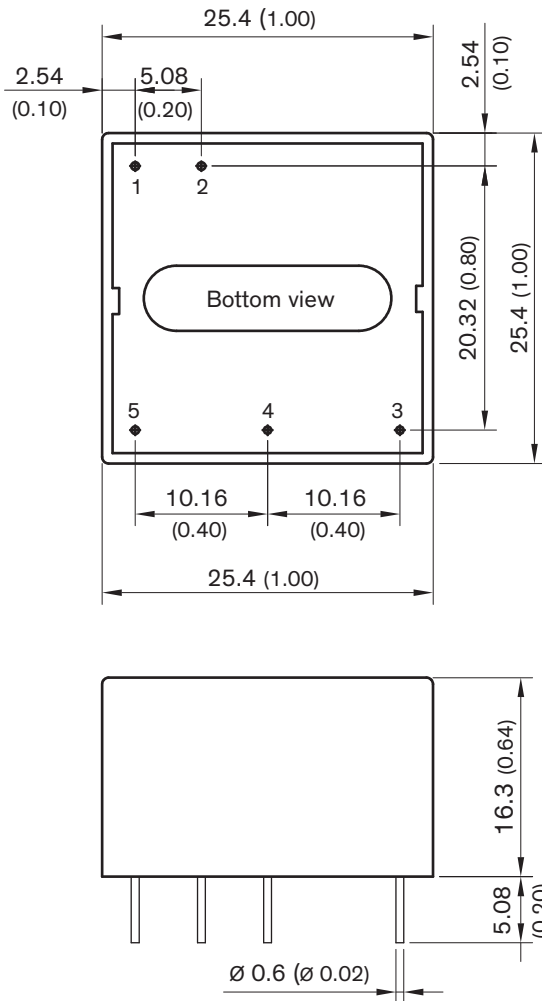
## Supporting Documents

Overview Link (for additional Documents)

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

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**Outline Dimensions**



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

NTC: Not to connect

Dimensions in mm (inch)  
 Outside dimension tolerance:  $\pm 0.5$  ( $\pm 0.02$ )  
 Pin pitch tolerance:  $\pm 0.25$  ( $\pm 0.01$ )  
 Pin diameter:  $\varnothing 0.6 \pm 0.1$  ( $\pm 0.004$ )