AC/DC Power Supply

TMPW 5 Series, 5 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 an 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 83%
- Internal EN 55032 class B filter
- Protection class II prepared
- 3 year product warranty

The TMPW 5 is a 5 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 ±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.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TMPW 5-103</td>
<td>5 W</td>
<td>3.3 VDC</td>
<td>1'515 mA</td>
<td>73 %</td>
</tr>
<tr>
<td></td>
<td>TMPW 5-105</td>
<td></td>
<td>5 VDC</td>
<td>1'000 mA</td>
<td>77 %</td>
</tr>
<tr>
<td></td>
<td>TMPW 5-112</td>
<td></td>
<td>12 VDC</td>
<td>420 mA</td>
<td>81 %</td>
</tr>
<tr>
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<td>TMPW 5-124</td>
<td></td>
<td>24 VDC</td>
<td>210 mA</td>
<td>83 %</td>
</tr>
</tbody>
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December 17, 2021
### Input Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>AC Range</th>
<th>DC Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Range</td>
<td>Operational: 90 - 305 VAC (Full Range)</td>
<td>Operational: 100 - 430 VDC</td>
</tr>
<tr>
<td></td>
<td>Rated: 100 - 277 VAC (Full Range)</td>
<td>Certified: 100 - 250 VDC</td>
</tr>
<tr>
<td>Polarity</td>
<td>irrelevant</td>
<td></td>
</tr>
<tr>
<td>(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.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Input Frequency
- Full Load & Vin = 230 VAC: 47 - 63 Hz (designed to meet 47 - 440 Hz)
- Full Load & Vin = 115 VAC: 90 mA max.
- At no load: 150 mA max.

#### Input Current
- At 230 VAC: 100 mW max. (Ready to meet ErP directive)
- At 115 VAC: 60 A max.
- At 115 VAC: 30 A max.

#### Recommended Input Fuse
- 1600 mA (slow blow)
- (The need of an external fuse has to be assessed in the final application.)

### Output Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Set Accuracy</td>
<td>±2% max.</td>
</tr>
</tbody>
</table>
| Regulation                     | 0.2% max.  (3.3 & 5 Vout models)  
- Input Variation (Vmin - Vmax)  
- Load Variation (0 - 100%) 0.1% max.  (other models)  
- 1% max.  (3.3 Vout model)  
- 0.5% max.  (other models) |
| Ripple and Noise (20 MHz Bandwidth) | 60 mVp-p max. (w/ 0.1 µF // 47 µF)  
3.3 VDC model: 60 mVp-p max. (w/ 0.1 µF // 47 µF)  
5 VDC model: 120 mVp-p max. (w/ 0.1 µF // 47 µF)  
12 VDC model: 200 mVp-p max. (w/ 0.1 µF // 47 µF)  
24 VDC model:  |
| Capacitive Load                | 3'500 µF max.  
3.3 VDC model: 2'500 µF max.  
5 VDC model: 470 µF max.  
12 VDC model: 150 µF max.  
24 VDC model: |
| Minimum Load                   | Not required |
| Temperature Coefficient        | ±0.02 %/K max. |
| Hold-up Time                   | - At 230 VAC: 15 ms min. |
| Start-up Time                  | - At 230 VAC: 60 ms max.  
- At 115 VAC: 60 ms max. |
| Short Circuit Protection       | Continuous, Automatic recovery  
(Prepared) |
| Output Current Limitation      | 115 - 195% of Iout max.  
(Prepared) |
| Overvoltage Protection         | 105 - 145% of Vout nom.  
(Prepared) |
| Transient Response             | 2% typ. / 3% max.  (50% to 75% Load Step)  
- Response Deviation  
- Response Time 500 µs max.  (50% to 75% Load Step)  
- Safety Specifications: Class I & II (Prepared: Reinforced Insulation)  
- Safety Standards  
- IT / Multimedia Equipment: EN 62368-1  
- IEC 62368-1  
- UL 62368-1  
- Household  
- EN 60335-1  
- IEC 60335-1  
- Power Transformers  
- IEC 61558-1  
- IEC 61558-2-16  
- Certification Documents: www.tracopower.com/overview/tmpw5  
- All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.  
- December 17, 2021  
- www.tracopower.com
### EMC Specifications

#### EMI Emissions
- Conducted Emissions: EN 55032 class B (internal filter)
- Radiated Emissions: EN 55032 class B (internal filter)
- Voltage Fluctuations & Flicker: EN 61000-3-3

#### EMS Immunity
- 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
  - EFT (Burst) / Surge: EN 61000-4-4, ±1 kV, perf. criteria A
- Conducted RF Disturbances
  - Continuous: EN 61000-4-6, 3 Vrms, perf. criteria A
  - Voltage Dips & Interruptions: EN 61000-4-8, 1 kV, perf. criteria A
- PF Magnetic Field
  - Continuous: EN 61000-4-5, ±1 kV, perf. criteria A
- Conducted RF Disturbances
  - Continuous: EN 61000-4-6, 3 Vrms, perf. criteria A
  - Voltage Dips & Interruptions: EN 61000-4-8, 1 kV, perf. criteria A
- PF Magnetic Field
  - Continuous: EN 61000-4-5, ±1 kV, perf. criteria A

#### Voltage Dips & Interruptions
- 230 VAC / 50 Hz: EN 61000-4-11
  - 30%, 25 periods, perf. criteria A
  - >95%, 250 periods, perf. criteria B
- 115 VAC / 60 Hz: EN 61000-4-11
  - 30%, 25 periods, perf. criteria A
  - >95%, 250 periods, perf. criteria B

### General Specifications

#### Relative Humidity
95% max. (non-condensing)

#### Temperature Ranges
- Operating Temperature: -40°C to +70°C
- Storage Temperature: -40°C to +85°C

#### Power Derating
- High Temperature: 2.5 %/K above 50°C (High Temperature)
- 2.0 %/K below ~30°C (Low Temperature)

#### 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
60 - 150 kHz (PWM) [PFM]

#### Insulation System
Reinforced Insulation

#### Working Voltage (rated)
314 VAC

#### Isolation Test Voltage
- Input to Output: 60 s
  - 4'000 VAC
  - 450’000 h (MIL-HDBK-217F; ground benign)

#### Reliability
- Calculated MTBF
  - 2 g, 3 axis, 60 min, 10-500 Hz, 10 min/cycle
  - IEC 60068-2-6

#### Environment
- Vibration
  - IEC 60068-2-6
- 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)

#### Weight
24 g

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

- REACH SVHC list compliant
- REACH Annex XVII compliant

- RoHS Declaration

Exemptions: 7c-I
(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.)

Supporting Documents
Overview Link (for additional Documents) www.tracopower.com/overview/tmpw5

Outline Dimensions

Pinout

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

NC: Not connected

Dimensions in mm (inch)
Tolerances: x.x ±0.5 (±0.02)

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