AC/DC Power Supply TMM 40C Series, 40 Watt

- Fully encapsulated low profile plastic casing in chassis mount version
- 2 x MOPP Medical safety according to AAMI/ANSI ES 60601-1:2005(R) and IEC/EN 60601-1 3rd edition
- IT and industrial safety according to IEC/EN/UL 62368-1 and UL 508
- Ready to meet ErP directive <0.3 W no load power consumption
- –40°C start-up temperature
- Safety class II prepared
- Protection against over-temperature, overload and short circuit
- 3-year product warranty

The TMM 40C Series of fully encapsulated 40 Watt AC/DC power supply modules feature a reinforced/double I/O isolation system according to latest medical safety standards 60601-3 3rd edition for 2 x MOPP (Means Of Patient Protection).

The high efficiency and the use of highest grade components make the units suitable for an operating temperature range of –40°C to +60°C without load derating. EMI/EMC characteristics and the safety approval package qualify these modules not only for medical devices but also for demanding applications in transportation systems and for equipment in industrial and commercial environment.

### Models

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Output Power</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMM 40105C</td>
<td>40 W</td>
<td>5 VDC</td>
<td>8'000 mA</td>
<td>81 %</td>
</tr>
<tr>
<td>TMM 40112C</td>
<td>12 VDC</td>
<td>3'330 mA</td>
<td></td>
<td>84 %</td>
</tr>
<tr>
<td>TMM 40115C</td>
<td>15 VDC</td>
<td>2'660 mA</td>
<td></td>
<td>85 %</td>
</tr>
<tr>
<td>TMM 40124C</td>
<td>24 VDC</td>
<td>1'660 mA</td>
<td></td>
<td>84 %</td>
</tr>
<tr>
<td>TMM 40212C</td>
<td>+12 VDC</td>
<td>1'660 mA</td>
<td>–12 VDC</td>
<td>84 %</td>
</tr>
<tr>
<td>TMM 40215C</td>
<td>+15 VDC</td>
<td>1'330 mA</td>
<td>–15 VDC</td>
<td>85 %</td>
</tr>
</tbody>
</table>

### Options

### Input Specifications

**Input Voltage**
- AC Range: Operational Range: 85 - 264 VAC (Full Range)
  - Rated Range: 100 - 240 VAC (Full Range)
- DC Range: Operational Range: 120 - 370 VDC (Designed for, no certification)
  - Polarity: irrelevant

**Input Frequency**
- Operational Range: 47 - 440 Hz
  - Certified: 50/60 Hz

**Input Current**
- Full Load & Vin = 230 VAC:
  - 5 VDC model: 430 mA max.
  - 12 VDC model: 415 mA max.
  - 15 VDC model: 410 mA max.
  - 24 VDC model: 415 mA max.
  - 12 / -12 VDC model: 415 mA max.
  - 15 / -15 VDC model: 410 mA max.
- Full Load & Vin = 115 VAC:
  - 5 VDC model: 720 mA max.
  - 12 VDC model: 690 mA max.
  - 15 VDC model: 680 mA max.
  - 24 VDC model: 690 mA max.
  - 12 / -12 VDC model: 690 mA max.
  - 15 / -15 VDC model: 680 mA max.

**Power Consumption**
- No load & Vin = 230 VAC: 750 mW max.
- No load & Vin = 115 VAC: 300 mW max.

**Input Inrush Current**
- At 230 VAC:
  - 60 A max.
- At 115 VAC:
  - 30 A max.

**Input Protection**
- T 2 A / 250 VAC (Internal Fuse in L & N)

**Recommended Input Fuse**
- 3'000 mA (Slow blow)
  - (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) single output models: 0.5% max.
  - dual output models: 0.5% max.
- Load Variation (0 - 100%) single output models: 1% max.
  - dual output models: 2% max., (Output 1)
  - dual output models: 2% max., (Output 2)

**Ripple and Noise**
- (20 MHz Bandwidth)
  - single output:
    - 5 VDC model: 90 mVp-p max.
    - 12 VDC model: 155 mVp-p max.
    - 15 VDC model: 195 mVp-p max.
    - 24 VDC model: 310 mVp-p max.
  - dual output:
    - 12 / -12 VDC model: 155 / 155 mVp-p max.
  - single output:
    - 5 VDC model: 80 mVp-p typ.
    - 12 VDC model: 120 mVp-p typ.
    - 15 VDC model: 150 mVp-p typ.
    - 24 VDC model: 240 mVp-p typ.
  - dual output:
    - 12 / -12 VDC model: 120 / 120 mVp-p typ.

**Capacitive Load**
- single output:
  - 5 VDC model: 8'000 µF max.
  - 12 VDC model: 3'900 µF max.
  - 15 VDC model: 3'900 µF max.
  - 24 VDC model: 680 µF max.
- dual output:
  - 12 / -12 VDC model: 1'500 / 1'500 µF max.
  - 15 / -15 VDC model: 1'000 / 1'000 µF max.

**Minimum Load**
- Not required

**Temperature Coefficient**
- ±0.02 %/K max.

All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.
Hold-up Time
- At 230 VAC 50 ms min.
- At 115 VAC 10 ms min.

Start-up Overshoot Voltage
5% max.

Short Circuit Protection
Continuous, Automatic recovery

Output Current Limitation
105% min. of Iout max.

Overvoltage Protection
120% typ. of Vout nom.
(By Zener diode)

Safety Specifications

Safety Standards
- IT / Multimedia Equipment
  EN 60950-1
  EN 62368-1
  IEC 60950-1
  IEC 62368-1
  UL 60950-1
  UL 62368-1
- Industrial Control Equipment
  UL 508
- Medical Equipment
  EN 60601-1
  IEC 60601-1
  ANSI/AAMI ES 60601-1
  CSA-C22.2, No 60601-1
  2 x MOPP (Means Of Patient Protection)
- Certification Documents
  www.tracopower.com/overview/tmm40c

Protection Class
Class I & II (Prepared: Reinforced Insulation)

Pollution Degree
PD 2

Over Voltage Category
OVC II

EMC Specifications

EMI Emissions
- Conducted Emissions
  EN 55011 class B (internal filter)
  EN 55032 class B (internal filter)
  FCC Part 15 class B (internal filter)
- Radiated Emissions
  EN 55011 class B (internal filter)
  EN 55032 class B (internal filter)
  FCC Part 15 class B (internal filter)

EMS Immunity
- Electrostatic Discharge
  Air: EN 61000-4-2, ±15 kV, perf. criteria A
  Contact: EN 61000-4-2, ±8 kV, perf. criteria A
- RF Electromagnetic Field
  EN 61000-4-3, 10 V/m, perf. criteria A
- EFT (Burst) / Surge
  EN 61000-4-4, ±2 kV, perf. criteria A
  L to L: EN 61000-4-5, ±1 kV, perf. criteria A
- Conducted RF Disturbances
  EN 61000-4-6, 10 Vrms, perf. criteria A
- PF Magnetic Field
  EN 61000-4-8, 30 A/m, perf. criteria A
- Voltage Dips & Interruptions
  Continuous: 230 VAC / 50 Hz: 30%, 25 periods, perf. criteria A
  >95%, 0.5 periods, perf. criteria A
  >95%, 1 period, perf. criteria A
  >95%, 250 periods, perf. criteria B

General Specifications

Relative Humidity
95% max. (non condensing)

Temperature Ranges
- Operating Temperature
  -40°C to +80°C
- Storage Temperature
  -40°C to +95°C

All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.
Power Derating  - High Temperature 3.75 %/K above 60°C

Over Temperature Protection Switch Off
- Protection Mode
- Measurement Point 142°C typ. (Automatic recovery at 67°C typ.)

Cooling System  Natural convection (20 LFM)

Altitude During Operation  5'000 m max.

Switching Frequency  130 kHz typ. (PWM)

Insulation System  Reinforced Insulation

Working Voltage (rated)  240 VAC

Isolation Test Voltage  - Input to Output, 60 s 4'000 VAC

Isolation Resistance  - Input to Output, 500 VDC 1'000 MΩ min.

Leakage Current  - Touch Current 100 µA max.

Reliability  - Calculated MTBF 200'000 h (MIL-HDBK-217F, ground benign)

Housing Material  Plastic resin (UL 94 V-0 rated)

Potting Material  Silicone (UL 94 V-0 rated)

Housing Type  Chassis Mount

Mounting Type  Screw Terminal

Weight  320 g

Environmental Compliance  - REACH Declaration www.tracopower.com/info/reach-declaration.pdf
- RoHS Declaration www.tracopower.com/info/rohs-declaration.pdf
- SCIP Reference Number 45711b36-cc73-4b98-876f-26ffa8b72a55

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

Dimensions in mm (inch)
- Tolerances ±0.5 (±0.02)
- Pin Ø 1.0 ±0.1 (0.04 ±0.004)
- Pin pitch tolerances ±0.25 (±0.01)

Mounting screw locked torque: max. 0.49 Nm (5.0 kgfcm)

**Pinout**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC (N)</td>
<td>AC (N)</td>
</tr>
<tr>
<td>2</td>
<td>AC (L)</td>
<td>AC (L)</td>
</tr>
<tr>
<td>3</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>5</td>
<td>–Vout</td>
<td>Common</td>
</tr>
<tr>
<td>6</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>7</td>
<td>NC</td>
<td>–Vout</td>
</tr>
</tbody>
</table>

NC: Not connected

Terminal screw locked torque: 0.5 Nm max.