

### Features

- ◆ Fully encapsulated low profile plastic casing in PCB- or 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/UL 60950-1 and UL 508
- ◆ Ready to meet ErP directive <0.3W 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



Also see:

**TMM 24 Series, 24 Watt**

[www.tracopower.com/products/tmm24.pdf](http://www.tracopower.com/products/tmm24.pdf)

**TMM 60 Series, 60 Watt**

[www.tracopower.com/products/tmm60.pdf](http://www.tracopower.com/products/tmm60.pdf)

The TMM 40 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 while it goes up to 75°C with 50% 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

| Order code |               | Output power max. | Output 1          | Output 2          | Efficiency |
|------------|---------------|-------------------|-------------------|-------------------|------------|
| PCB mount  | Chassis mount |                   |                   |                   |            |
| TMM 40105  | TMM 40105C    | 40 W              | 5.0 VDC / 8000 mA |                   | 83 %       |
| TMM 40112  | TMM 40112C    |                   | 12 VDC / 3330 mA  |                   | 83 %       |
| TMM 40115  | TMM 40115C    |                   | 15 VDC / 2660 mA  |                   | 83 %       |
| TMM 40124  | TMM 40124C    |                   | 24 VDC / 1660 mA  |                   | 84 %       |
| TMM 40212  | TMM 40212C    |                   | +12 VDC / 1660 mA | -12 VDC / 1660 mA | 84 %       |
| TMM 40215  | TMM 40215C    |                   | +15 VDC / 1330 mA | -15 VDC / 1330 mA | 84 %       |

### Input Specifications

|                                                              |            |                                        |
|--------------------------------------------------------------|------------|----------------------------------------|
| Input voltage ranges                                         | – nominal  | 100 – 240 VAC                          |
|                                                              | – AC input | 85 – 264 VAC                           |
|                                                              | – DC Input | 120 – 370 VDC                          |
| Input frequency                                              |            | 47 – 440 Hz                            |
| Input current at full load (115 VAC / 230 VAC nominal input) |            | 690 mA / 415 mA typ.                   |
| Leakage current                                              |            | 80 µA typ.                             |
| No-Load power consumption                                    |            | <0.3 W                                 |
| External input fuse required (recommended value)             |            | 3 A slow blow type or characteristic C |

### Output Specifications

|                                                           |                           |                                                              |
|-----------------------------------------------------------|---------------------------|--------------------------------------------------------------|
| Voltage set accuracy                                      |                           | ±2% typ.                                                     |
| Minimum load                                              |                           | no minimum load required                                     |
| Regulation                                                | – Input variation         | 0.5% typ.                                                    |
|                                                           | – Load variation (0-100%) | single output models: 1.0% typ.                              |
|                                                           |                           | dual output models: 2.0% typ.                                |
| Temperature coefficient                                   |                           | 0.02 %/K                                                     |
| Ripple and noise (20 MHz bandwidth)                       | 5.0 VDC model:            | <1.8% of Vout [Vp-p] max.                                    |
|                                                           | other models:             | <1.3% of Vout [Vp-p] max.                                    |
| Current limitation                                        |                           | above 105 % of rated output current.<br>hicup, auto recovery |
| Overvoltage protection by Zehner diode (main output only) |                           | 120 % of Vout typ.                                           |
| Short circuit protection                                  |                           | continuous                                                   |
| Max. capacitive load                                      | 5.0 VDC model:            | 8000 µF                                                      |
|                                                           | 12 VDC model:             | 3900 µF                                                      |
|                                                           | 15 VDC model:             | 3900 µF                                                      |
|                                                           | 24 VDC model:             | 680 µF                                                       |
|                                                           | ±12 VDC model:            | 1500 µF (each output)                                        |
|                                                           | ±15 VDC model:            | 1000 µF (each output)                                        |

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

## General Specifications

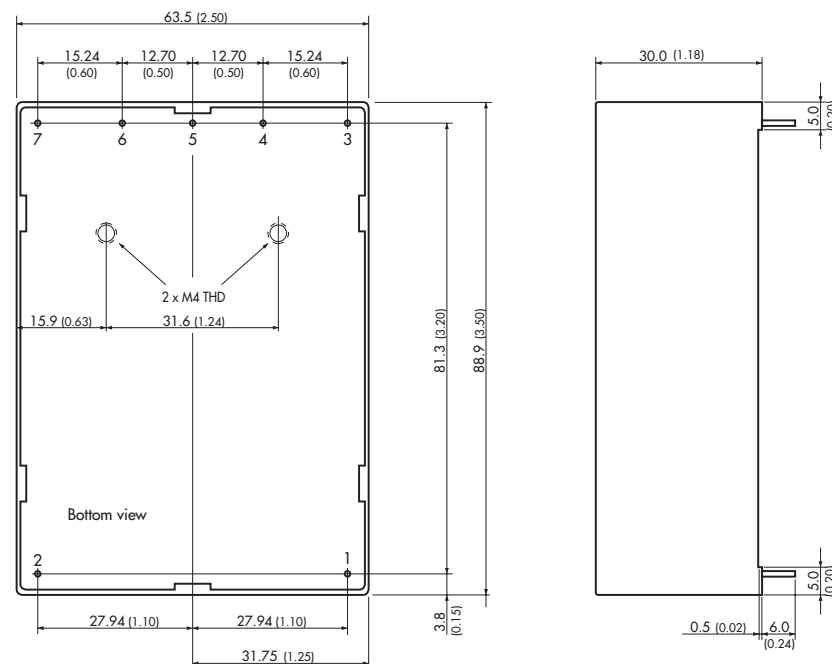
|                                                                                    |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature ranges                                                                 | <ul style="list-style-type: none"> <li>– Operating (natural convection cooling 20 LFM)</li> <li>– Power derating above +60°C</li> <li>– Storage (non operating)</li> </ul>                                                                                                                                   | –40°C to +80°C<br>3.75 %/K<br>–40°C to +95°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Over temperature protection                                                        | shutdown:<br>automatic recovery:                                                                                                                                                                                                                                                                             | at 90°C<br>at approx 67°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Humidity (non condensing)                                                          |                                                                                                                                                                                                                                                                                                              | 95 % rel max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Altitude during operation                                                          |                                                                                                                                                                                                                                                                                                              | 5000 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Switching frequency (pulse width modulation PWM)                                   |                                                                                                                                                                                                                                                                                                              | 130 kHz typ.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Hold-up time                                                                       | 115 VAC:<br>230 VAC:                                                                                                                                                                                                                                                                                         | 25 ms typ.<br>80 ms typ.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Isolation voltage                                                                  | – Input/Output                                                                                                                                                                                                                                                                                               | 4'000 VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Isolation resistance                                                               | – at 500 VDC                                                                                                                                                                                                                                                                                                 | 1'000 MOhm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Reliability /calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)              |                                                                                                                                                                                                                                                                                                              | >200'000 h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| EMI / RFI conducted and radiated                                                   |                                                                                                                                                                                                                                                                                                              | EN 55022, class B, FCC part 15, level B<br>EN 55011 class B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Electromagnets compatibility (EMC), immunity                                       | <ul style="list-style-type: none"> <li>– Electrostatic discharge ESD</li> <li>– RF field immunity</li> <li>– Electrical fast transients/burst immunity</li> <li>– Surge</li> <li>– Conducted RF</li> <li>– Magnetic field immunity</li> </ul>                                                                | IEC / EN 61000-4-2, 8kV/4kV perf. criteria B<br>IEC / EN 61000-4-3, 10V/m perf. criteria A<br>IEC / EN 61000-4-4, ± 2kV perf. criteria B<br>IEC / EN 61000-4-5, ± 1kV/± 2kV perf. criteria B<br>IEC / EN 61000-4-6, 10 Vr.m.s perf. criteria B<br>IEC / EN 61000-4-8, 30A/m perf. criteria A                                                                                                                                                                                                                                                               |
| Voltage dip and interruptions according to EN 61000-4-11 reference: 115 VAC / 60Hz |                                                                                                                                                                                                                                                                                                              | 30%, 10ms perf. criteria B<br>60%, 100ms perf. criteria C<br>95%, 5000ms perf. criteria C                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Protection class II                                                                |                                                                                                                                                                                                                                                                                                              | according IEC/EN 60536                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Safety standards                                                                   |                                                                                                                                                                                                                                                                                                              | UL 60950-1, IEC/EN 60950-1,<br>IEC/EN 60601-1 3rd edition, 2 x MOPP<br>ANSI/AAMI ES60601-1:2005(R)2012<br>UL 508 for chassis mount version                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Safety approvals and certifications                                                | <ul style="list-style-type: none"> <li>– UL online certification (ES60601-1:2005(R)2012)</li> <li>– UL certificate (UL 60950-1)</li> <li>– UL approval for UL 508 (chassis mount models only)</li> <li>– CB certificate (60601-1 3rd edition 2 x MOPP)</li> <li>– CB certificate (IEC/EN 60950-1)</li> </ul> | <a href="http://www.ul.com">www.ul.com</a> File e188913, copy: <a href="http://www.ul.com">www.ul.com</a> File e188913, copy: e188913qqqm2.pdf<br><a href="http://www.ul.com">www.ul.com</a> File e188913, copy: e188913qqqg2.pdf<br><a href="http://www.ul.com">www.ul.com</a> -> certifications -> File: e322109<br><a href="http://www.tracopower.com/products/imm24-cb60601.pdf">www.tracopower.com/products/imm24-cb60601.pdf</a><br><a href="http://www.tracopower.com/products/imm24-cb60950.pdf">www.tracopower.com/products/imm24-cb60950.pdf</a> |
| Casing material                                                                    |                                                                                                                                                                                                                                                                                                              | plastic resin + fiberglass (UL 94V-0 rated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Environmental compliance                                                           | <ul style="list-style-type: none"> <li>– Reach</li> <li>– RoHS</li> </ul>                                                                                                                                                                                                                                    | <a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a><br>RoHS directive 2011/65/EU                                                                                                                                                                                                                                                                                                                                                                                                      |

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## Outline Dimensions

**TMM 40:**

for PCB mount:

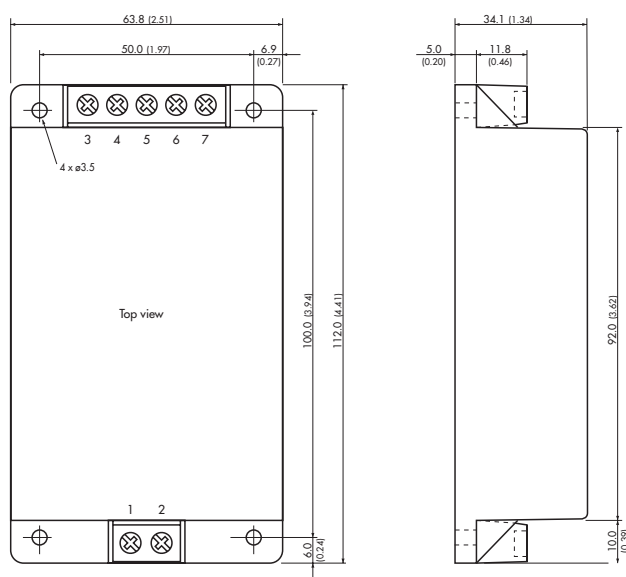


Pin diameter  $\varnothing$  1.0 mm (0.039)

**Weight:** 310 g (10.94oz)

**TMM 40C:**

for chassis mount:



**Weight:** 320 g (11.29oz)

## Pinout / Connection

| Pin/con. | Single      | Dual        |
|----------|-------------|-------------|
| 1        | AC (N)      | AC (N)      |
| 2        | AC (L)      | AC(L)       |
| 3        | +Vout       | +Vout       |
| 4        | No Pin / NC | No Pin / NC |
| 5        | -Vout       | Common      |
| 6        | No Pin / NC | No Pin / NC |
| 7        | NC          | -Vout       |

NC = not to connect

Dimensions in [mm], ( ) = Inches

Tolerances = 0.5mm (0.02)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)