Ultra-Low Profile Open Frame Power Supplies Medical

Not For New Design Please refer to exact equivalent product series MULP40

The MBC41 Series of ultra-low open frame medical power supplies feature a wide universal AC input range of 85 V – 264 VAC, offering output power 40 W with natural convection cooling. They are available in a variety of isolated single output voltages. The MBC41 ultra low profile series is also available in a PCB mount format, facilitating simple embedded integration onto user's main PCB assembly.

The MBC Series is designed and approved to the latest medical standards (EN/IEC 60601-1), providing 2 x MOPP isolation for Class I & Class II applications.

These power supplies are ideal for medical, telecom, datacom, industrial equipment and other applications.

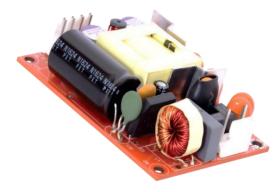
Key Features & Benefits

- 3 x 2 x 0.75 Inch Form factor
- PCB Mount option available
- 40 Watts Convection
- Approved to EN/IEC 60601-1
- Efficiencies 85% Typical
- -40 to 70 °C operating temperature
- Dual fusing
- 2 million hours, Telcordia -SR332-issue 3 MTBF
- No Load Power < 0.3 W
- Medical (BF) Safety Approvals

Applications

- Diagnostic
- Drug Pump
- Monitoring

- Dialysis
- Home Health Care
- Portable Equipment





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1. MODEL SELECTION

| MODEL NUMBER ¹ | CONNECTOR | VOLTAGE | MAX. LOAD | MIN. LOAD | RIPPLE & NOISE ² |
|---------------------------|---------------------------|---------|-----------|-----------|-----------------------------|
| MBC41-1T05L | Screw Terminal | | | | |
| MBC41-1005L | Header | 5 V | 5 A | 0.0 A | 1.5% |
| MBC41-1005P | PCB Mount | | | | |
| MBC41-1T12L | Screw Terminal | | | | |
| MBC41-1012L | Header | 12 V | 3.33 A | 0.0 A | 1% |
| MBC41-1012P | PCB Mount | | | | |
| MBC41-1T15L | Screw Terminal | | | | |
| MBC41-1015L | Header | 15 V | 2.67 A | 0.0 A | 1% |
| MBC41-1015P | PCB Mount | | | | |
| MBC41-1T24L | Screw Terminal | | | | |
| MBC41-1024L | Header | 24 V | 1.67 A | 0.0 A | 1% |
| MBC41-1024P | PCM Mount | | | | |
| MBC41-1T30L | Screw Terminal | | | | |
| MBC41-1030L | Header | 30 V | 1.33 A | 0.0 A | 1% |
| MBC41-1030P | PCB Mount | | | | |
| MBC41-1T48L | Screw Terminal | | | | |
| MBC41-1048L | Header | 48 V | 0.83 A | 0.0 A | 1% |
| MBC41-1048P | PCB Mount | | | | |
| MBC41-1T58L | Screw Terminal | | | | |
| MBC41-1058L | Header | 58 V | 0.69 A | 0.0 A | 1% |
| MBC41-1058P | PCB Mount | | | | |
| COVER-41-XBC ³ | Metal cover kit accessory | | | | |

¹ For Class II Option (without input Earth pin) add suffix: -2 (e.g.: MBC41-1012L-2).

² Ripple is peak to peak with 20 MHz bandwidth and 10 μF (Electrolytic capacitor) in parallel with a 0.1 μF capacitor at rated line voltage and load ranges.

³ When used in Cover Kit, de-rate output power to 70 % under all operating conditions. Note: Cover Kit is not suited for PCB mount version.

2. INPUT SPECIFICATIONS

Specifications are for nominal input voltage, 25°C unless otherwise stated.

| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATION |
|---------------------|---|--------------------------|
| Input Voltage | Universal | 85 - 264 VAC / 390 VDC |
| Input Frequency | | 47 - 63 Hz |
| Input Current | 115 VAC: 230 VAC: | 0.8 A max. 0.4 A max. |
| No Load Power | Typical | < 0.3 W |
| Inrush Current | 115 VAC: 230 VAC: 264 VAC: | 25 A 45 A 75 A |
| Leakage Current | Typical (N.A. For Class II Option) Touch current | 300 Α μΑ < 100 μΑ |
| Switching Frequency | Typical | 65 kHz |



3. OUTPUT SPECIFICATIONS

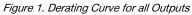
| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATION |
|--------------------------|---|-----------------------|
| Output Power | Convection cooling | 40 W |
| Efficiency | Typical | 85% |
| Hold-up Time | 230 VAC: | 6 ms |
| Line Regulation | | ± 0.5% |
| Load Regulation | | ±1% |
| Transient Response | 25% step load change, at 0.1 A/ μs slew rate, 50% duty cycle, 50 Hz = 4% | recovery time < 5 ms |
| Rise Time | Typical | 50 ms |
| Set Point Tolerance | | 2% (3% for 5 V model) |
| Over Current Protection | | > 110% |
| Over Voltage Protection | | 110 to 140% |
| Short Circuit Protection | Hiccup mode | |
| Cooling | Convection | |
| | | |

4. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATION |
|------------------------------------|--|-------------------------|
| Operating Temperature ⁴ | -40 to 0°C startup is guaranteed with spec deviation | -40 to +70°C |
| Storage Temperature | | -40 to +85°C |
| Relative Humidity | Non-condensing | 5% to 95% |
| Altitude | Operating: Non-operating: | 16,000 ft 40,000 ft. |
| MTBF | Telcordia -SR332-issue 3 | 2 million hours |

⁴ Output ripple can be more than 10% of the output voltage.





De-rate linearly from 100% at 50°C to 50% at 70°C



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5. EMC SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATION |
|------------------------------------|--|----------------------|
| Conducted Emissions | EN 55011-B, CISPR22-B, FCC PART15-B | Pass |
| Radiated Emissions | EN 55011 A; with external core (King core K5B RC 25x12x15-M in input cable) | Pass Level B |
| Input Current Harmonics | EN 61000-3-2 | Class A |
| Voltage Fluctuation and Flicker | EN 61000-3-3 | Pass |
| ESD Immunity | EN 61000-4-2 | Level 4, Criterion A |
| Radiated Field Immunity | EN 61000-4-3 | Level 3, Criterion A |
| Electrical Fast Transient Immunity | EN 61000-4-4 | Level 3, Criterion A |
| Surge Immunity | EN 61000-4-5 | Level 3, Criterion A |
| Conducted Immunity | EN 61000-4-6 | Level 3, Criterion A |
| Magnetic Field Immunity | EN 61000-4-8 | Level 4, Criterion A |
| Voltage Dips, Interruptions | EN 61000-4-11 | Criterion A & B |
| | | |

6. SAFETY SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATION |
|--------------------|---|---|
| Isolation Voltage | Input to Output: (Medical applications) Input to GND: (Not Applicable For Class II Option) Output to GND: for type BF for type B (N/A for Class II Option) | 4000 VAC 1500 VAC 1500 VAC 500 VAC |
| Safety Standard(s) | EN 60601-1, IEC 60601-1 (ed.3), ANSI / AAMI ES 60601 - 1, CSA C22.2 No. 60601-1 | |
| Agency Approvals | Nemko, UL, C-UL | |
| CE mark | Complies with LVD Directive | |

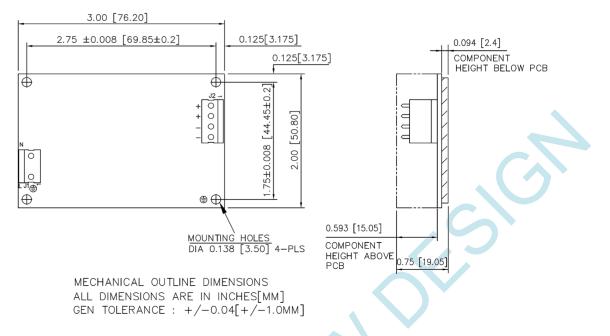
7. CONNECTOR & PIN DESCRIPTION

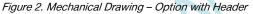
| CONNECTOR | PIN | DESCRIP | TION / CONDITION | MANUFACTURER / PN | |
|---------------------|----------------------------------|-------------------------|-------------------------------------|--|----------|
| AC Input Connector | J1 Screw Terminal / Header | Pin 1 Pin 2 Pin 3 | AC Line Not Fitted AC Neutral | Tyco: 640445-3 Mating: 647402-3; Pins: 3-647409-1 | (Header) |
| DC Output Connector | J2 Screw Terminal / Header | Pin 1, 2 Pin 3, 4 | V1 +VE V1 -VE | Tyco: 640445-4 Mating: 647402-4; Pins: 3-647409-1 | |

8. MECHANICAL SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION |
|------------|--|
| Weight | approx. 100 g |
| Dimensions | 76.2 x 50.8 x 19.05 mm (3 x 2 x 0.75 in) |







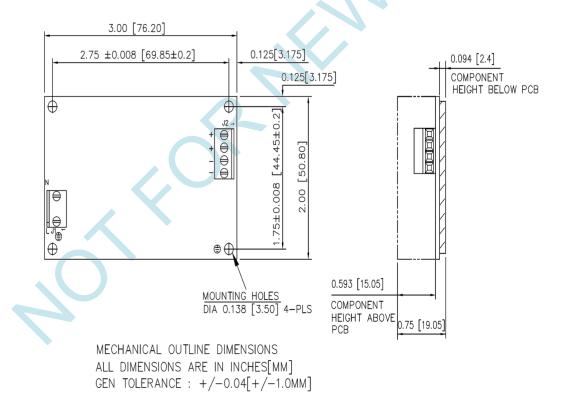


Figure 3. Mechanical Drawing – Option with Screw Terminal



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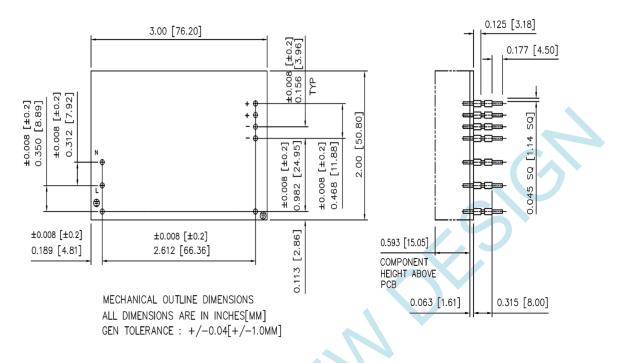


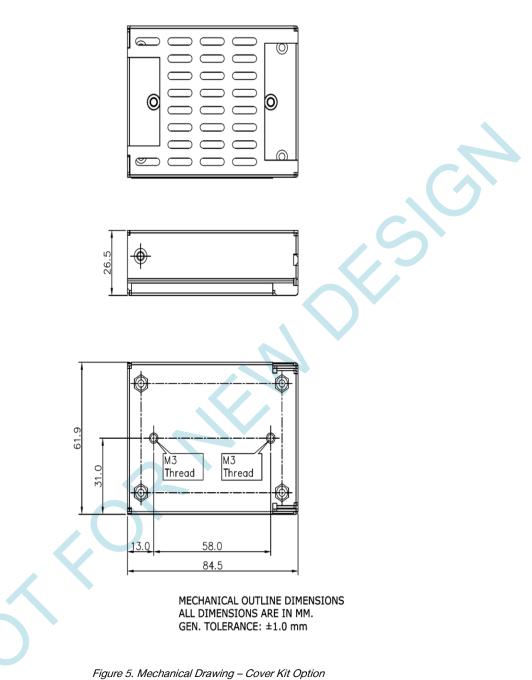
Figure 4. Mechanical Drawing – PCB Mount Option

NOTES: In case the PCB is mounted in a metal enclosure, using metal hardware ensure the following:

- Stand off, used to mount PCB has OD of 5.4 mm max. 1
- Screws, used to fix PCB on stand off, have head dia of 6.0 mm max.
- 2 3 Washer, if used, to have dia of 6.5 mm max.







For more information on these products consult: tech.support@psbel.com

NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.



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