



**THE DATASHEET OF  
MBC41-1T48L**



# MBC41 Series

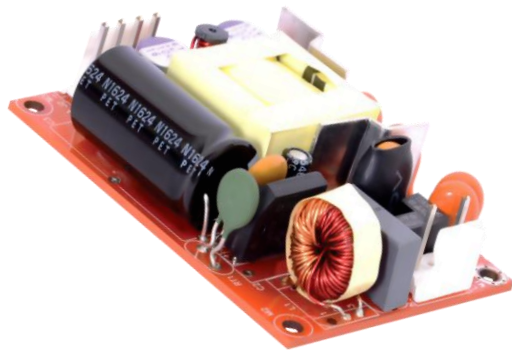
## Ultra-Low Profile Open Frame Power Supplies Medical

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 <sup>1</sup>	CONNECTOR	VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE <sup>2</sup>
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 <sup>3</sup>	Metal cover kit accessory				

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

<sup>2</sup> Ripple is peak to peak with 20 MHz bandwidth and 10  $\mu$ F (Electrolytic capacitor) in parallel with a 0.1  $\mu$ F capacitor at rated line voltage and load ranges.

<sup>3</sup> 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 A $\mu$ A < 100 $\mu$ A
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 <sup>4</sup>	-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

<sup>4</sup> Output ripple can be more than 10% of the output voltage.

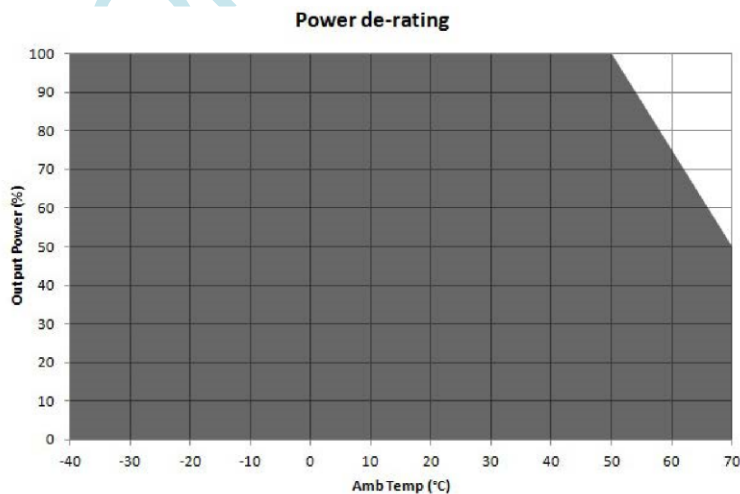


Figure 1. Derating Curve for all Outputs

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

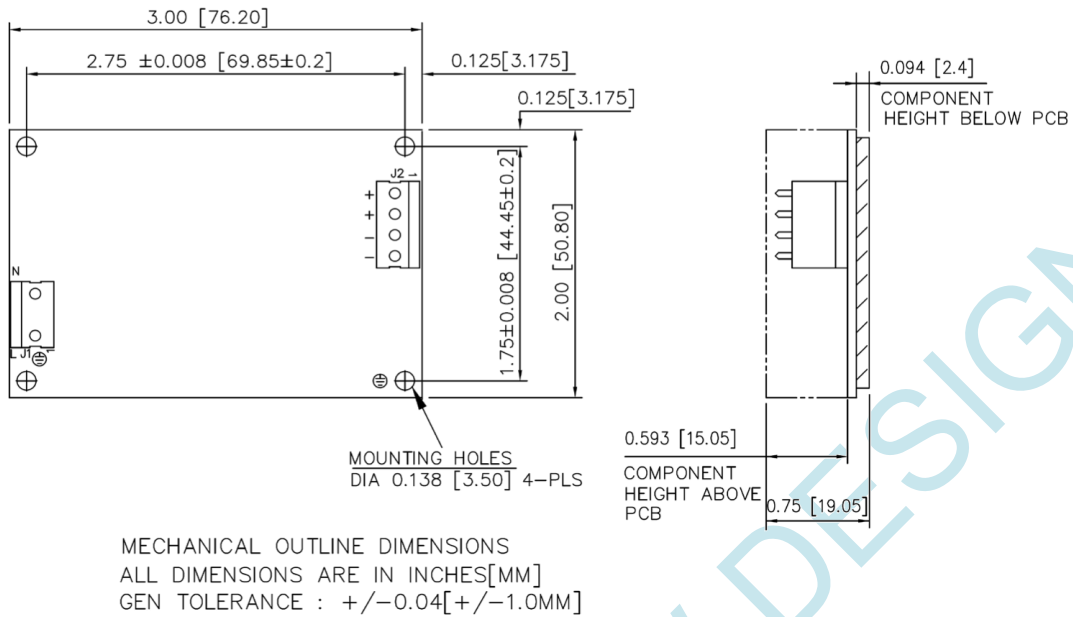


Figure 2. Mechanical Drawing – Option with Header

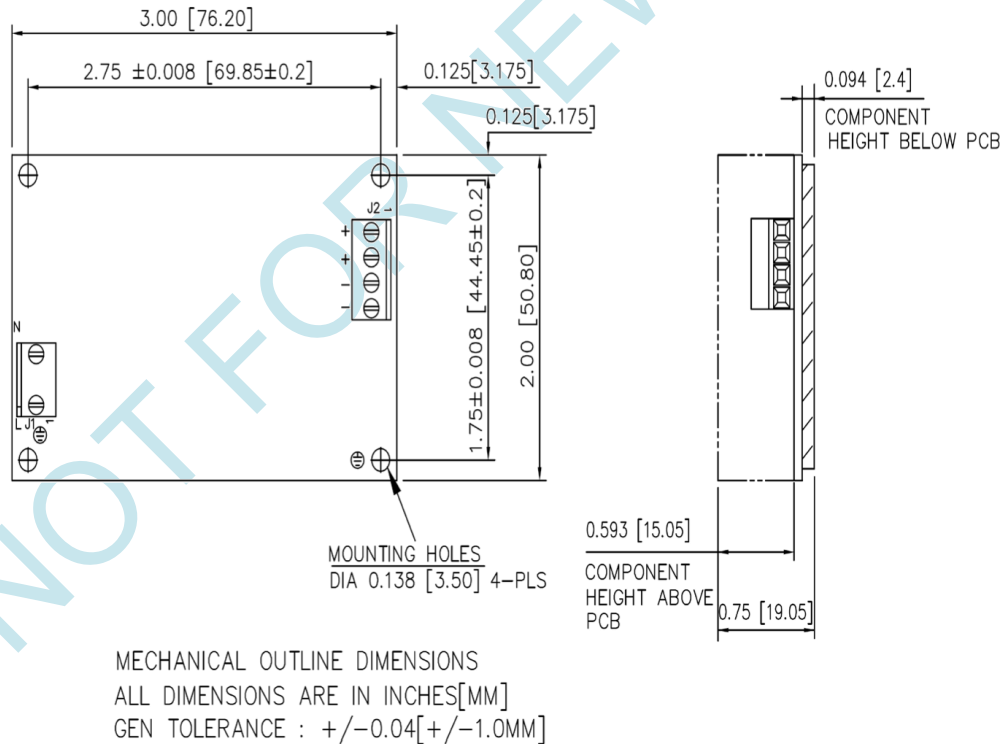


Figure 3. Mechanical Drawing – Option with Screw Terminal

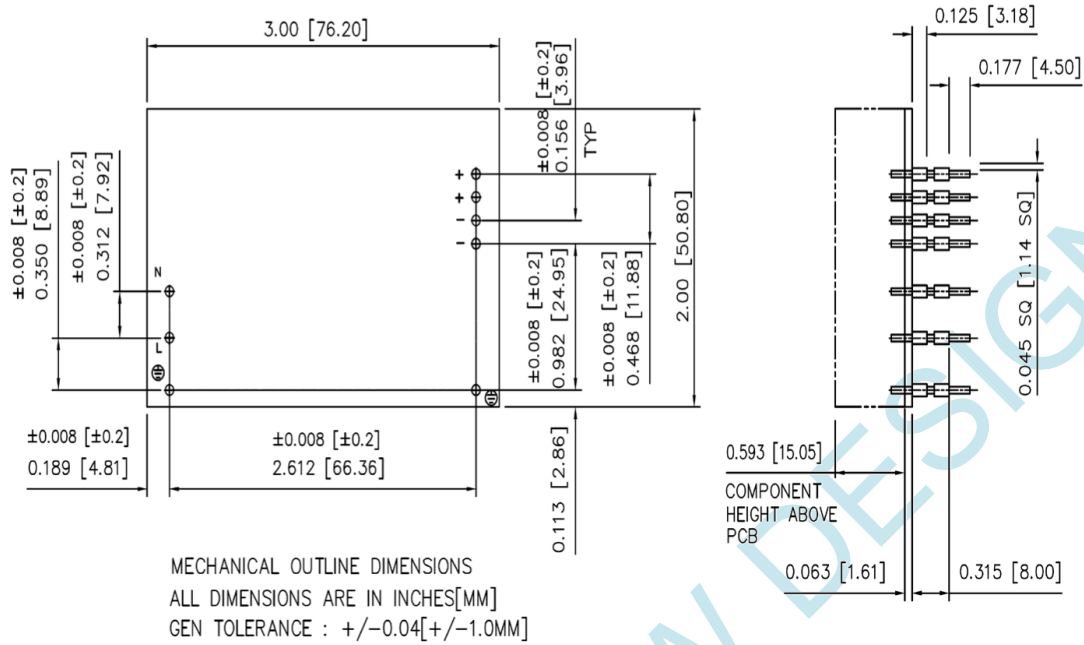
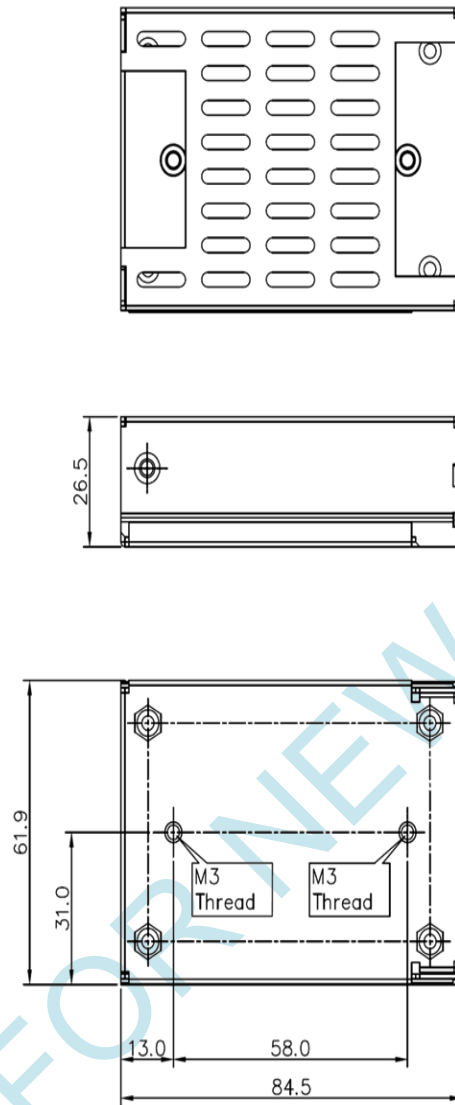


Figure 4. Mechanical Drawing – PCB Mount Option

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

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



MECHANICAL OUTLINE DIMENSIONS  
 ALL DIMENSIONS ARE IN MM.  
 GEN. TOLERANCE:  $\pm 1.0$  mm

Figure 5. Mechanical Drawing – Cover Kit Option



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**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.

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