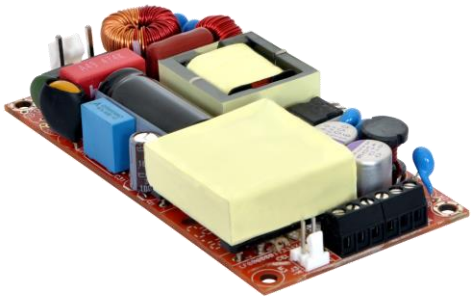
MBC180 Series

Ultra-Low Profile Open Frame Power Supplies Medical

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Please refer to exact equivalent product series
MULP180

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RoHS Compliant

The MBC180 Series of ultra low open frame medical power supplies feature a wide universal AC input range of 85 V – 264 VAC, offering output power 180 W with 13 CFM of forced air cooling or up to 120 W with natural convection cooling. They are available in a variety of isolated single output voltages.

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

- 4 x 2 x 0.75 Inches Form factor
- 180 Watts with Forced Air Cooling
- Approved to EN/IEC 60601-1
- Efficiencies up to 92%
- -40 to 70°C degree operating temperature
- Dual Fusing
- 12 V / 0.5 A Fan Output, Thermal Shut-Down feature
- 3.37 million Hours, Telcordia -SR332-issue 3 MTBF
- Standby Power < 0.5 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]	OUTPUT CONNECTOR	VOLTAGE	MAX. LOAD			POWER
			CONVECTION 50°C (112.5 W)	CONVECTION 40°C (120 W)	13 CFM (180 W)	
MBC180-1T12L MBC180-1012L	Screw Terminal Header Molex Connector	12 V	9.37 A	10 A	15 A	180 W
MBC180-1T15L MBC180-1015L	Screw Terminal Header Molex Connector	15 V	7.5 A	8 A	12 A	180 W
MBC180-1T24L MBC180-1024L	Screw Terminal Header Molex Connector	24 V	4.68 A	5 A	7.5 A	180 W
MBC180-1T30L MBC180-1030L	Screw Terminal Header Molex Connector	30 V	3.75 A	4 A	6 A	180 W
MBC180-1T48L MBC180-1048L	Screw Terminal Header Molex Connector	48 V	2.34 A	2.5 A	3.75 A	180 W
MBC180-1T58L MBC180-1058L	Screw Terminal Header Molex Connector	58 V	1.94 A	2.07 A	3.1 A	180 W
COVER-180-XBC [2]	Metal Cover Kit (accessory)					

[1] Class II version available. Add suffix "-2" at the end of the Model Number
[2] When used in Cover Kit, de-rate output power to 70 % under all operating conditions.

2. INPUT SPECIFICATIONS

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

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Input Voltage	Universal (Derate from 100% at 100 VAC to 77% at 80 VAC)	80 – 264 VAC / 390 VDC
Input Frequency		47 – 63 Hz
Input Current	115 VAC: 230 VAC:	2.2 A max. 1.1 A max.
No Load Power	Typical	< 0.5 W (models without PGPF) < 0.85 W (models with PGPF)
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 µA < 100 µA
Switching Frequency	PFC PWM	70 – 130 kHz 50 – 80 kHz

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3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Output Voltage	Refer to Model selection table	From 12 V to 58 V
Output Power [3]	13 CFM (forced air cooling) Convection (natural cooling)	180 W up to 120 W
Efficiency	48 V, 58 V: 24 V, 30 V: 12 V, 15 V:	92% 90% 88%
Hold-up Time	At 180 W: At 120 W:	10 ms 16 ms
Power Factor	115 VAC: 230 VAC:	> 0.95 0.90
Line Regulation [4]		± 0.5%
Load Regulation [4]		± 1%
Minimum Load		0.0 A
Transient Response	25% step load change, at 0.1 A/ µs slew rate, 50% duty cycle, 50 Hz = 4%	recovery time < 5 ms
Ripple [4, 5]	24, 30, 48 & 58 V outputs 12 V & 15 V outputs	1.0 % max. 2.0 % max.
Output Voltage Adjustment [6]		± 3%
Rise Time	Typical	55 ms
Set Point Tolerance [4]		± 1%
Over Current Protection		> 110%
Over Voltage Protection		110 to 140%
Short Circuit Protection	Hiccup mode	
Cooling	With 13 CFM forced air cooling (100 to 264 VAC) [7] With natural convection cooling (100 to 264 VAC) [8]	180 W Up to 120 W

[3] Combined output power of main output, fan supply shall not exceed max. power rating.
[4] Fan supply output voltage tolerance including set point accuracy, line and load regulation is ± 10% and ripple and noise is less than 10%.
[5] 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.
[6] Adjustment potentiometer is located on the SMT side of the PCB
[7] Refer to Mechanical Drawing
[8] Refer to Derating Curve

4. 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 D
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 B

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5. SAFETY SPECIFICATIONS

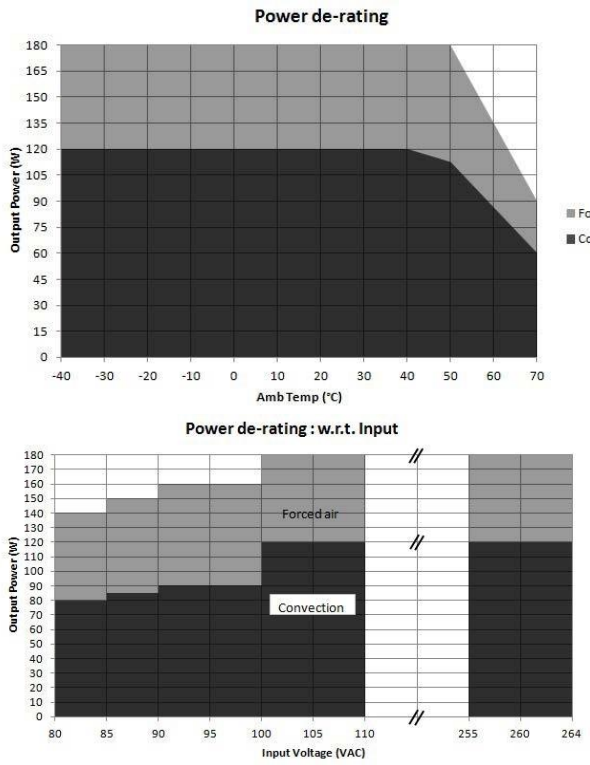
PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Isolation Voltage	Input to Output: (Medical applications) Input to GND: (N/A for Class II Option) Output to GND: for type BF (for type B (N/A for Class II Option)	4000 VAC 1500 VAC 1500 VAC 500 VAC
Safety Standard(s)	EN 60601-1, IEC 60601-1 (ed.3), ANSI / AAMI ES 60601 - 1, CSA C22.2 No. 60601-1	
Agency Approvals	Nemko, UL, C-UL	
CE mark	Complies with LVD Directive	

6. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Operating Temperature	-40 to 0°C startup guaranteed, with spec deviation [9]	-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	3.37 million hours

[9] Output ripple can be more than 10% of the output voltage.

DERATING CURVES



Convection load: 120 W up to 40 °C
De-rate between 40-50 °C @ 0.625% per °C
De-rate above 50 °C @ 2.33% per °C

Forced air cooled load: 180 W up to 50°C
De-rate above 50 °C @ 2.5% per °C

Figure 1. Power Derating Curves

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7. CONNECTOR & PIN DESCRIPTION

CONNECTOR	PIN	DESCRIPTION / CONDITION		MANUFACTURER / PN
AC Input Connector	J1	Pin 1 Pin 2 Pin 3	AC Line Not Fitted AC Neutral [10]	Molex: 26-60-4030 Mating: 09-50-3031; Pins: 08-50-0106
DC Output Connector	J2	Pin 1, 2, 3 Pin 4. 5. 6	V1 +VE V1 -VE	Option 1 (Screw Terminal): Molex: 39357 Series or equivalent Option 2 (Molex Connector): Molex: 26-60-4060 Mating: 09-50-3061; Pins: 08-50-0106
Aux (Fan) Output	J3	Pin 1 Pin 2	FAN +VE FAN -VE	AMP: 640456-2 Mating: 640440-2

[10] Fusing on neutral for ITE model is optional.

8. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION
Weight	approx. 200 g
Dimensions	101.6 x 50.8 x 19.05 mm (4 x 2 x 0.75 inches)

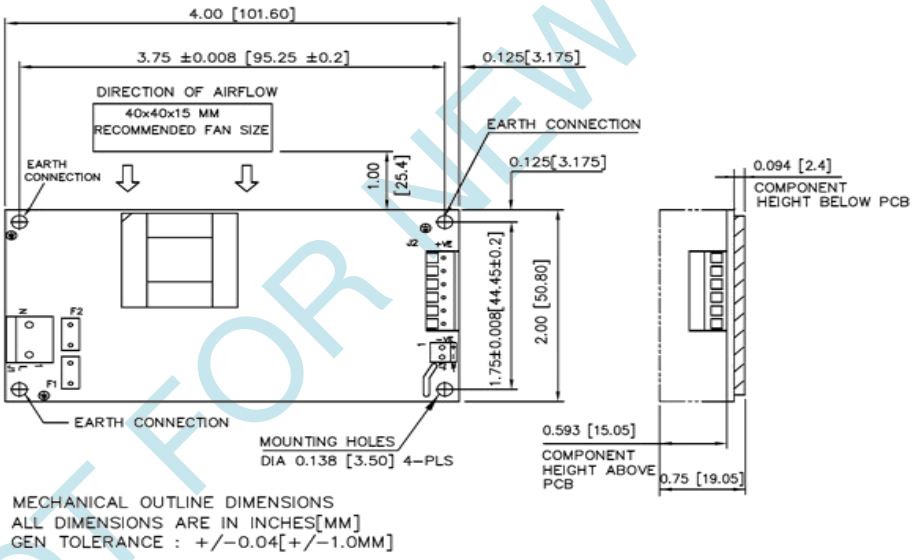


Figure 3. Mechanical Drawing – Option 1 (Output Connector – Screw Terminal)

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.

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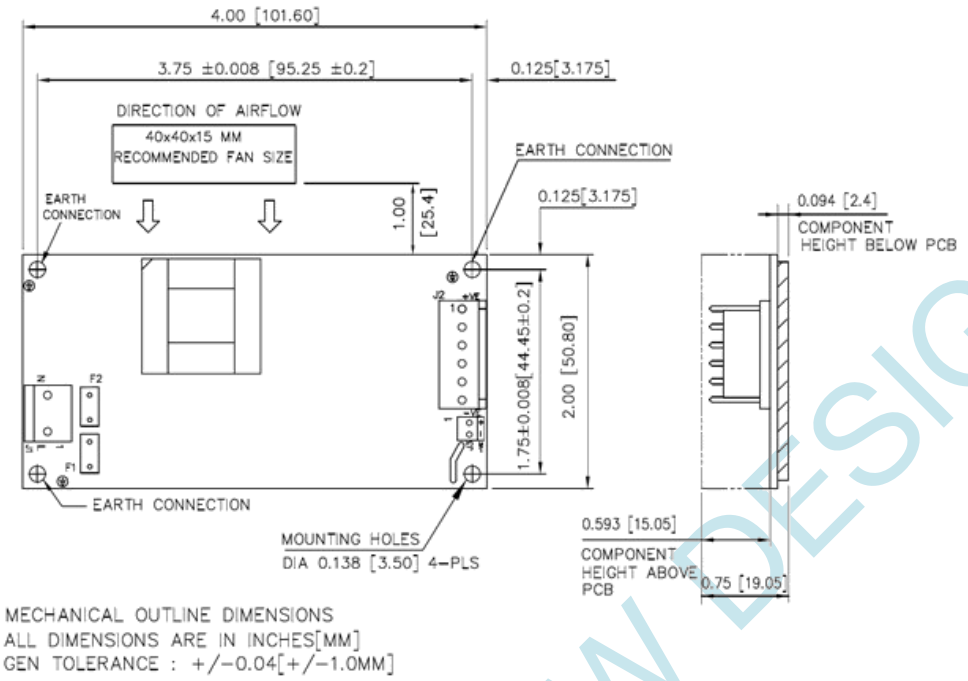


Figure 4. Mechanical Drawing – Option 2 (Output Connector – Header Molex)

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

4 Stand off, used to mount PCB has OD of 5.4 mm max.
5 Screws, used to fix PCB on stand off, have head dia of 6.0 mm max.
6 Washer, if used, to have dia of 6.5 mm max.

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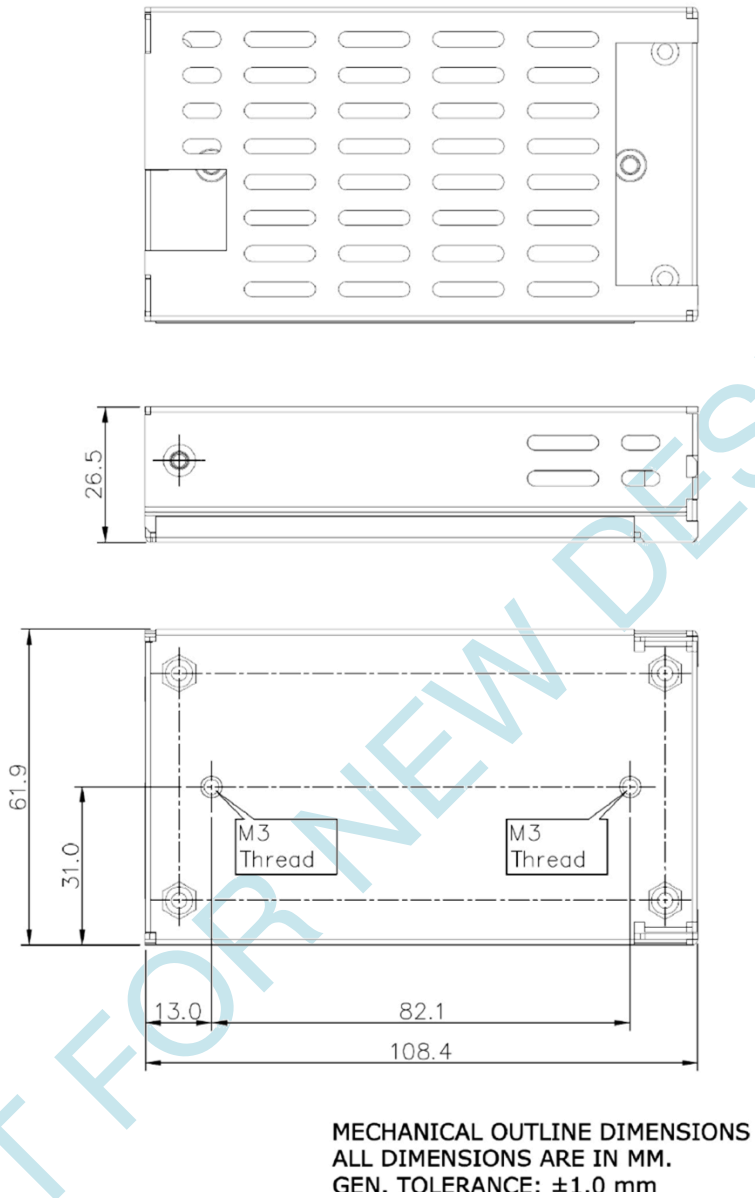


Figure 5. Mechanical Drawing – Cover Kit Option

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