MBC180 Series

Ultra Low Profile

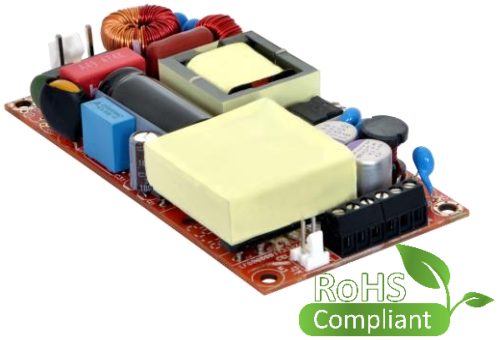
Open Frame Power Supplies

Medical

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]	CONNECTOR	VOLTAGE	MAX. LOAD (CONVECTION) 112.5 W @ 50°C	MAX. LOAD (CONVECTION) 120 W @ 40°C	MAX. LOAD (13 CFM)	MIN. LOAD	RIPPLE & NOISE[2]
MBC180-1T12L MBC180-1012L	Screw Terminal Molex Connector	12 V	9.37 A	10 A	15 A	0.0 A	2%
MBC180-1T15L MBC180-1015L	Screw Terminal Molex Connector	15 V	7.5 A	8 A	12 A	0.0 A	2%
MBC180-1T24L MBC180-1024L	Screw Terminal Molex Connector	24 V	4.68 A	5 A	7.5 A	0.0 A	1%
MBC180-1T30L MBC180-1030L	Screw Terminal Molex Connector	30 V	3.75 A	4 A	6 A	0.0 A	1%
ABC180-1T36 ABC180-1036	Screw Terminal Molex Connector	36 A	3.125	3.33 A	13 A	0.0 A	1%
MBC180-1T48L MBC180-1048L	Screw Terminal Molex Connector	48 V	2.34 A	2.5 A	3.75 A	0.0 A	1%
MBC180-1T58L MBC180-1058L	Screw Terminal Molex Connector	58 V	1.94 A	2.07 A	3.1 A	0.0 A	1%
COVER-180-XBC[3]	metal cover kit accessory						

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 for MBC180-1XXX	< 0.5 W
Inrush Current	115 VAC: 230 VAC: 264 VAC:	25 A 45 A 75 A
Leakage Current	Typical (N.A. For Class II Option- without input Earth pin) Touch current	300 µA < 100 µA
Power Factor	115 VAC: 230 VAC:	> 0.95 0.90
Switching Frequency	PFC PWM	70 to 130 kHz 50 to 80 kHz

[1] For Class II Option (without input Earth pin) add suffix: -2 (e.g.: MBC180-1012L-2).

[2] Ripple is peak to peak with 20 MHz bandwidth and 10 µF (Tantalum 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.

3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Output Power[4]	With 13 CFM forced air cooling With natural convection cooling at 100 to 264 VAC	180 W up to 120 W
Efficiency (typical @ 230 VAC full load)	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
Line Regulation		+/-0.5%
Load Regulation		+/-1%
Transient Response	25% step load change, at 0.1 A/uS slew rate, 50% duty cycle, 50 Hz = 4%	recovery time < 5 ms
Voltage Adjustment[5]		+/-3%
Rise Time	Typical	55 ms
Set Point Tolerance[6]		+/-1%
Over Current Protection		> 110%
Over Voltage Protection		110 to 140%
Short Circuit Protection	Hiccup mode	

4. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Operating Temperature[7]	Startup guaranteed with spec. deviation	-40 to +70°C -40 to 0°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

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 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

[4] Combined output power of main output, fan supply shall not exceed max. Power rating.

[5] Adjustment potentiometer is located on the SMT side of the PCB.

[6] Fan supply output voltage tolerance including set point accuracy, line & load regulation is +/-10% and Ripple & noise is less than 10%.

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

6. SAFETY SPECIFICATIONS

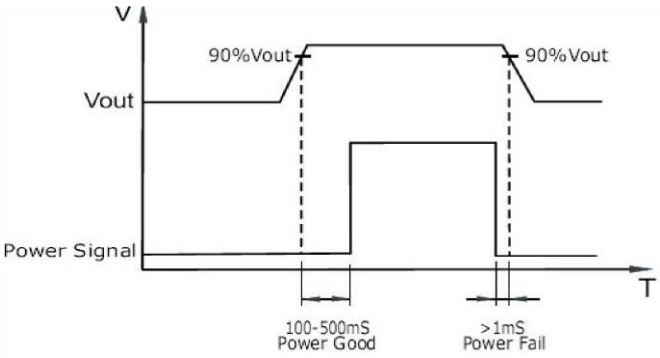
PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Isolation Voltage	Input to Output: (Medical applications) Input to GND: (Not Applicable For Class II Option) Output to GND: for type BF (for type B (N/A for Class II Option)	4000 VAC 1500 VAC 1500 VAC 500 VAC
Safety Standard(s)	Approved to the latest edition of the following standards: CSA/UL60601-1, EN60601-1 and IEC60601-1.	
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	Pin 1 Pin 2 Pin 3	AC Line Not Fitted AC Neutral	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
Signal Output[8]	J4	Pin 1 Pin 2 Pin 3	Vs GDN	AMP :640456-3 Mating: 640440-3

8. MECHANICAL SPECIFICATIONS

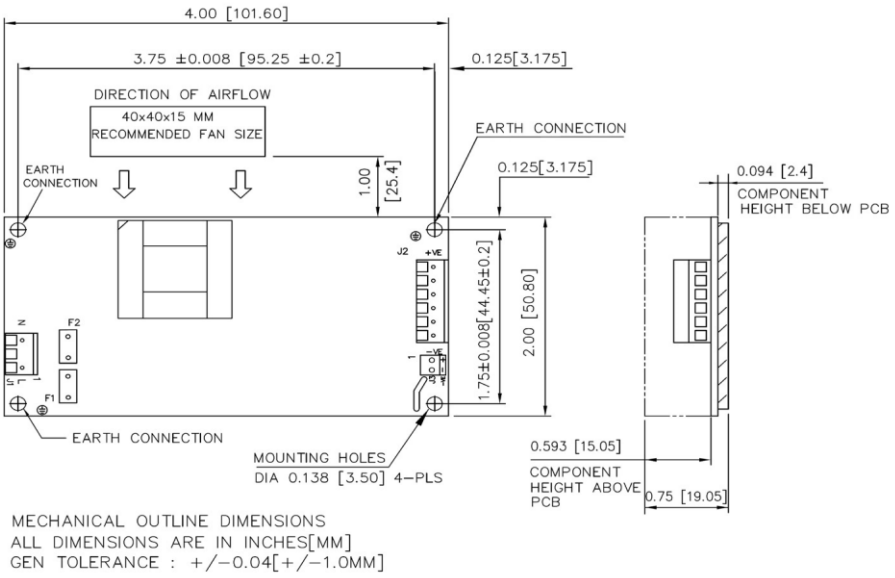
PARAMETER	DESCRIPTION / CONDITION
Weight	approx. 200 g
Dimensions	101.6 x 50.8 x 19.05 mm (4 x 2 x 0.75 inches)
Cooling[9]	180 W with 13 CFM forced air cooling (refer to Mechanical Drawing) Up to 120 W with natural convection cooling (refer to Derating Curve)



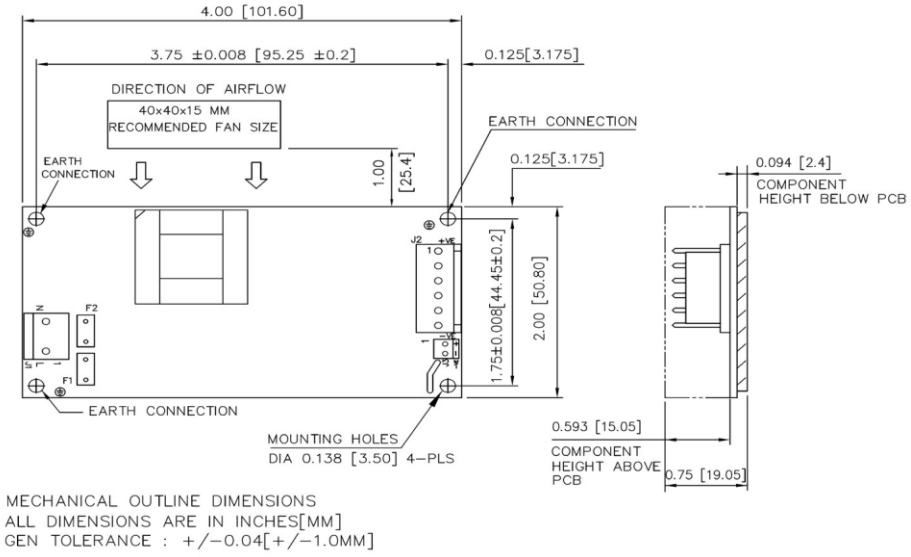
Power good / AC fail signal specs

[8] A TTL signal is available at pin 2 of J4 which goes high 100-500mS after output voltage reaches 90% of set value. It goes low a minimum of 1 ms before output falls below 90% of the set value, when input AC is switched off.

[9] 180 W with 13CFM forced air cooling and 120 W with natural convection cooling at 100 to 264 VAC.



Mechanical Drawing – Option 1

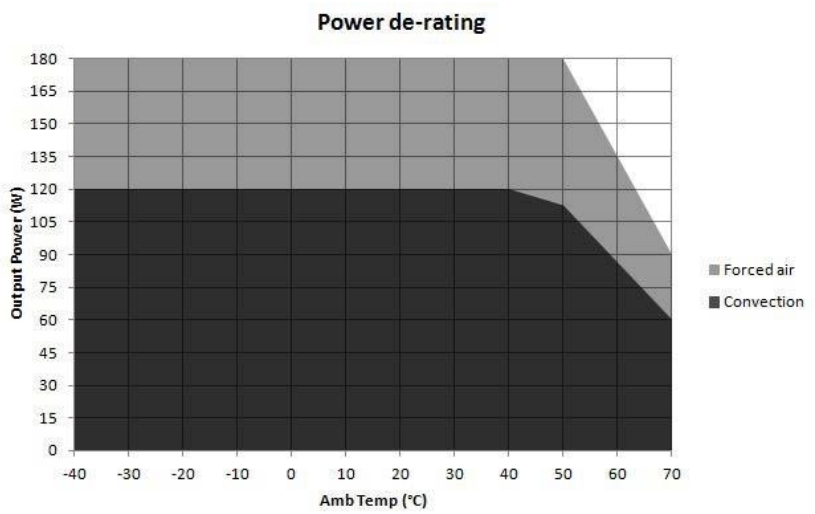


Mechanical Drawing – Option 2

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

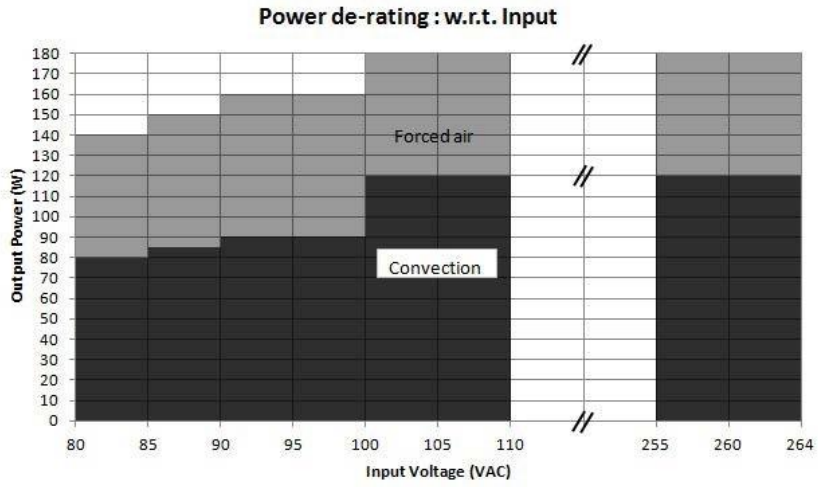
1 Stand off, used to mount PCB has OD of 5.4 mm max.
2 Screws, used to fix PCB on stand off, have head dia of 6.0 mm max.
3 Washer, if used, to have dia of 6.5 mm max.

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



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