MBC350 Series

Low Profile Open Frame Power Supplies Medical

Not For New Design
Please refer to exact equivalent product series
MWLP350



The MBC350 Series of open frame medical power supplies feature a wide universal AC input range of 90 – 264 VAC, offering 350 W of output power in a compact 3 x 5 x 1 inch footprint, with 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.

RoHS Compliant

Key Features & Benefits

- 3 x 5 x 1 Inch Form Factor
- 350 W with Forced Air Cooling & 200 W with Convection Cooling
- Approved to EN/IEC 60601-1
- Efficiencies up to 94%
- -40 to 70°C Operating Temperature
- 12 V / 0.5 A Fan Output, Thermal Shut-Down Feature
- 2.56 Million Hours, Telcordia -SR332-Issue 3 MTBF
- Standby Power < 0.5 W
- Medical (BF) Safety Approvals
- RoHS Compliant

Applications

- Diagnostic
- Drug Pump
- Dialysis
- Home Health Care
- Monitoring
- Portable Equipment

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Please read our datasheet & drawing disclaimer here.

1. MODEL SELECTION

MODEL NUMBER [1]	DESCRIPTION	VOLTAGE	MAX. LOAD (CONVECTION)	MAX. LOAD (375 LFM)	POWER
MBC350-1T12L MBC350-1012L	Screw Terminal Molex Connector	12 V	15 A	25 A 18.75 A	300 W 225 W
MBC350-1T15L MBC350-1015L	Screw Terminal Molex Connector	15 V	12 A	21.67 A 18. A	325 W 270 W
MBC350-1T24L MBC350-1024L	Screw Terminal Molex Connector	24 V	8.33 A	14.60 A	350 W
MBC350-1T30L MBC350-1030L	Screw Terminal Molex Connector	30 V	6.67 A	11.67 A	350 W
MBC350-1T48L MBC350-1048L	Screw Terminal Molex Connector	48 V	4.17 A	7.30 A	350 W
MBC350-1T58L MBC350-1058L	Screw Terminal Molex Connector	58 V	3.45 A	6.04 A	350 W
COVER-350-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 90% at 90 VAC)	90-264 VAC / 390 VDC
Input Frequency		47 - 63 Hz
Input Current	115 VAC: 230 VAC:	3.6 A max. 1.8 A max.
No Load Power	Typical	>0.5 W
Inrush Current	115 VAC: 230 VAC: 264 VAC:	25 A 45 A 75 A
Leakage Current	Typical Touch Current	300 uA <100 uA
Power Factor	Full Load	>0.95
Switching Frequency	PFC: PWM:	70 - 130 KHz 50 - 80 KHz

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3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Output Voltage		12 to 58 V
Output Power [3]	With 375 LFM: Convection:	350 W 200 W
Output Adjustment		+/-3%
Hold-up Time	Full Load: Convection Load:	> 8 ms typical > 14 ms typical
Efficiency	48 V, 58 V: 24 V, 30 V: 12 V, 15 V:	94% 93% 92%
Line Regulation [5]		+/-0.5%
Load Regulation [5]		+/-1%
Minimum Load		0.0 A
Transient Response	50-100% step load change, at 0.1A/µS slew rate, 50% duty cycle, 50 Hz = 5% ,	recovery time < 5 ms
Ripple [4, 5]	For all outputs	1.0 % max
Rise Time	Typical	55 ms
Set Point Tolerance [5]		+/-1%
Over Current Protection	Hiccup mode / Auto Recovery	>110%
Over Voltage Protection	Hiccup mode / Auto Recovery	110 to 140%
Short Circuit Protection	Hiccup mode / Auto Recovery	
Cooling	With 375 LFM forced air cooling at 100 to 264 VAC: With natural convection cooling at 100 to 264 VAC:	350 W 200 W

[3] Combined output power of main output, fan supply shall not exceed max. power rating.
[4] 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.
[5] Fan supply output voltage tolerance including set point accuracy, line and load regulation is +/-10 % and ripple and noise is less than 10 %.

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 4, 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: (For 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	

6. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Operating Temperature [6]	-40 to 0°C startup guaranteed, with spec deviation [7]	-40 to +70°C
Storage Temperature		-40 to 85° C
Altitude	Operating: Non-operating:	16,000 ft. 40,000 ft.
Humidity	Non-Condensing	5% to 95%
Reliability	MTBF according to Telcordia - SR332-Issue 3	2.56 million hours

[6] Thermal shutdown feature: The power supply goes in hiccup mode when the temperature of PCB exceeds 110 °C (+/-10 °C).
[7] Output ripple can be more than 10% of the output voltage.

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	Screw Terminal (Option 1)	Pin 1 Pin 2	V1 +VE V1 - VE	6-32 inches Screw Pan HD Mating: 16 AWG wire crimped to Ring Tongue Terminal AMP: 8-31886-1
		Molex Connector (Option 2)	Pin 1,2,3,4 Pin 5,6,7,8	V1 +VE V1 - VE	Molex: 26-60-4080 Mating: 09-50-3081; Pins: 08-50-0106
Aux (Fan) Output	J3		Pin 1 Pin 2	FAN +VE FAN -VE	AMP :640456-2 Mating: 640440-2
Earth	J4				Molex: 19705-4301 Mating: 19003-0001

8. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION
Weight	300 g
Dimensions	76.2 x 127.0 x 25.4 mm (3 x 5 x 1 inch)

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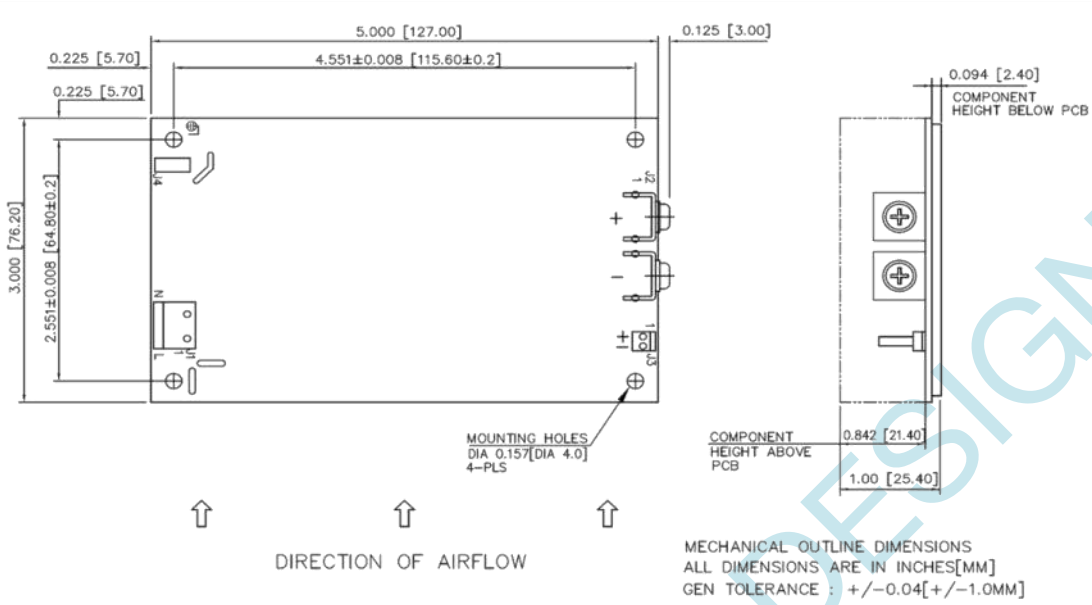


Figure 1. Mechanical Drawing - Screw Terminal (Option 1)

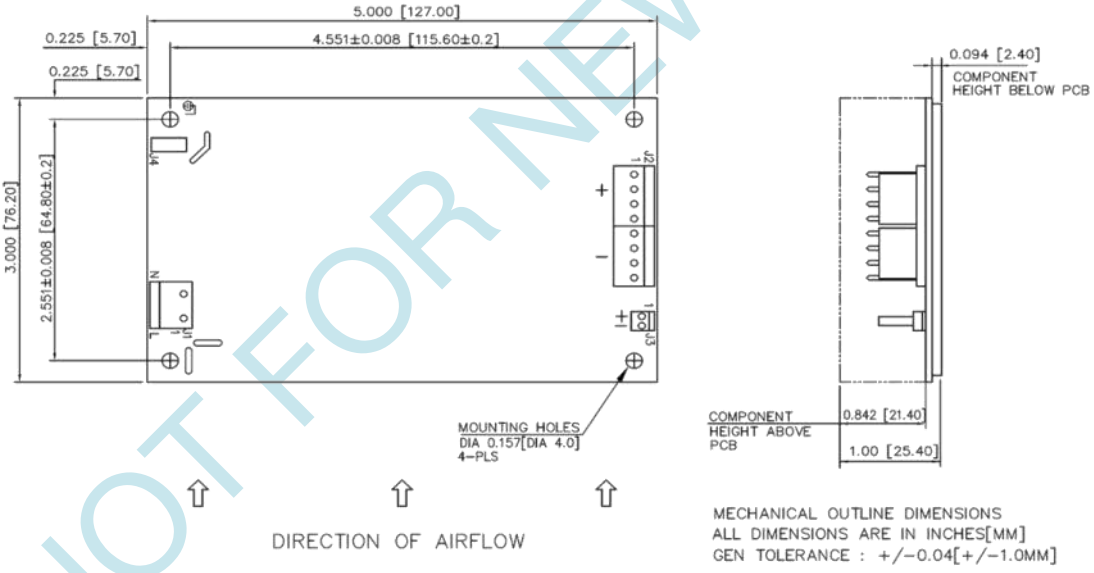


Figure 2. Mechanical Drawing - Molex Header (Option 2)

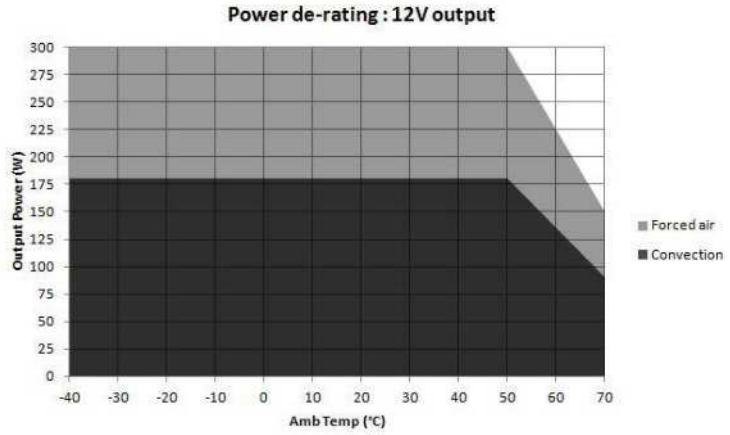
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NOTES: In case the PCB is mounted in a metal enclosure, using metal hardware ensure the following:

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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DERATING CURVES



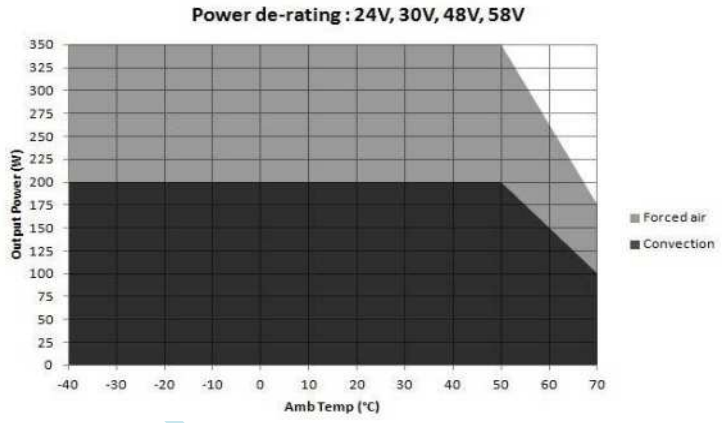
Convection load: 180 W up to 50 °C
De-rate above 50 °C @ 2.5% per °C

Forced air cooled load: 300 W up to 50°C
De-rate above 50 °C @ 2.5% per °C



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

Forced air cooled load: 325 W up to 50°C
De-rate above 50 °C @ 2.5% per °C



Convection load: 200 W up to 50 °C
De-rate above 50 °C @ 2.5% per °C

Forced air cooled load: 350 W up to 50°C
De-rate above 50 °C @ 2.5% per °C

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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.