



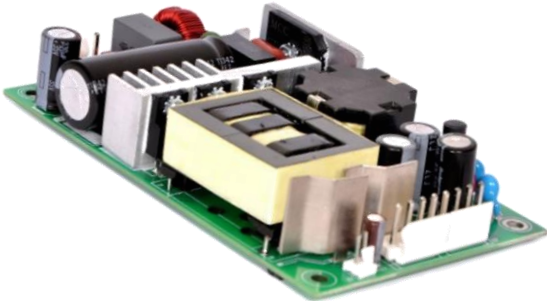
# MBC350 Series

Low Profile  
Open Frame Power Supplies  
Medical

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.



### 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



**bel** POWER SOLUTIONS & PROTECTION

a bel group

[belfuse.com/power-solutions](http://belfuse.com/power-solutions)

## 1. MODEL SELECTION

MODEL NUMBER <sup>1</sup>	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 <sup>2</sup>	Metal cover kit (accessory)				

<sup>1</sup> Class II version available. Add suffix "-2" at the end of the Model Number

<sup>2</sup> 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

### 3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Output Voltage		12 to 58 V
Output Power <sup>3</sup>	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 <sup>5</sup>		+/-0.5%
Load Regulation <sup>5</sup>		+/-1%
Minimum Load		0.0 A
Transient Response	50-100% step load change, at 0.1A/ $\mu$ S slew rate, 50% duty cycle, 50 Hz = 5% ,	recovery time < 5 ms
Ripple <sup>4,5</sup>	For all outputs	1.0 % max
Rise Time	Typical	55 ms
Set Point Tolerance <sup>5</sup>		+/-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

<sup>3</sup> Combined output power of main output, fan supply shall not exceed max. power rating.

<sup>4</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>5</sup> 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

## 5. SAFETY SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Isolation Voltage	Input to Output: (For medical applications)	4000 VAC
	Input to GND: (Not Applicable For Class II Option)	1500 VAC
	Output to GND: for type BF for type B (N/A For Class II Option)	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 <sup>6</sup>	-40 to 0°C startup guaranteed, with spec deviation <sup>7</sup>	-40 to +70°C
Storage Temperature		-40 to 85° C
Altitude	Operating:	16,000 ft.
	Non-operating:	40,000 ft.
Humidity	Non-Condensing	5% to 95%
Reliability	MTBF according to Telcordia - SR332-Issue 3	2.56 million hours

<sup>6</sup> Thermal shutdown feature: The power supply goes in hiccup mode when the temperature of PCB exceeds 110 °C (+/-10 °C).

<sup>7</sup> 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	AC Line	
		Pin 2	Not Fitted	
		Pin 3	AC Neutral	
DC Output Connector	J2	Screw Terminal (Option 1)	Pin 1	V1 +VE
			Pin 2	V1 - VE
		Molex Connector (Option 2)	Pin 1,2,3,4	V1 +VE
			Pin 5,6,7,8	V1 - VE
Aux (Fan) Output	J3	Pin 1	FAN +VE	
		Pin 2	FAN -VE	
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)

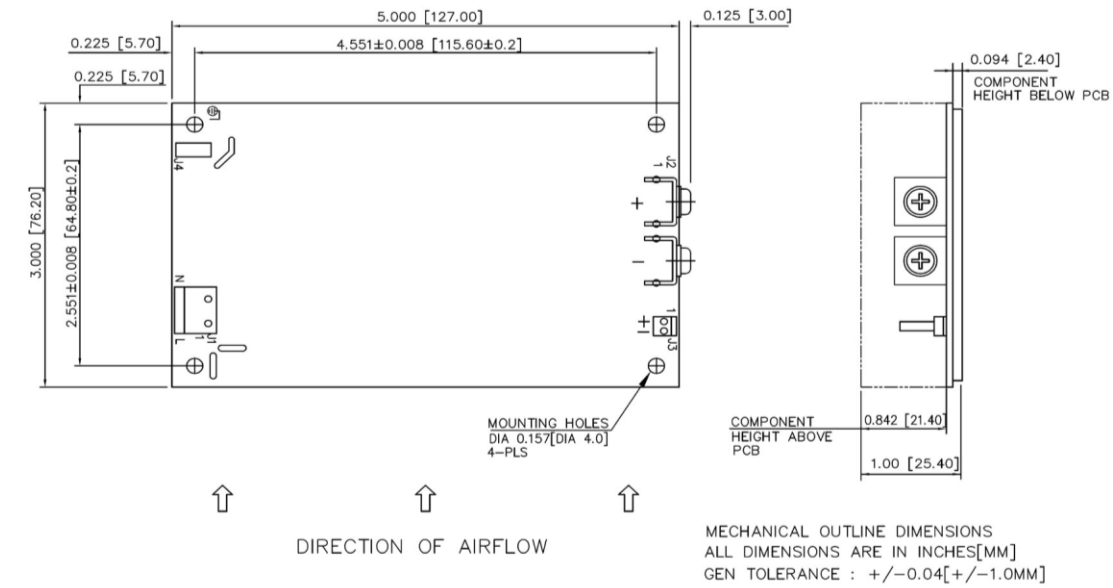


Figure 1. Mechanical Drawing - Screw Terminal (Option 1)

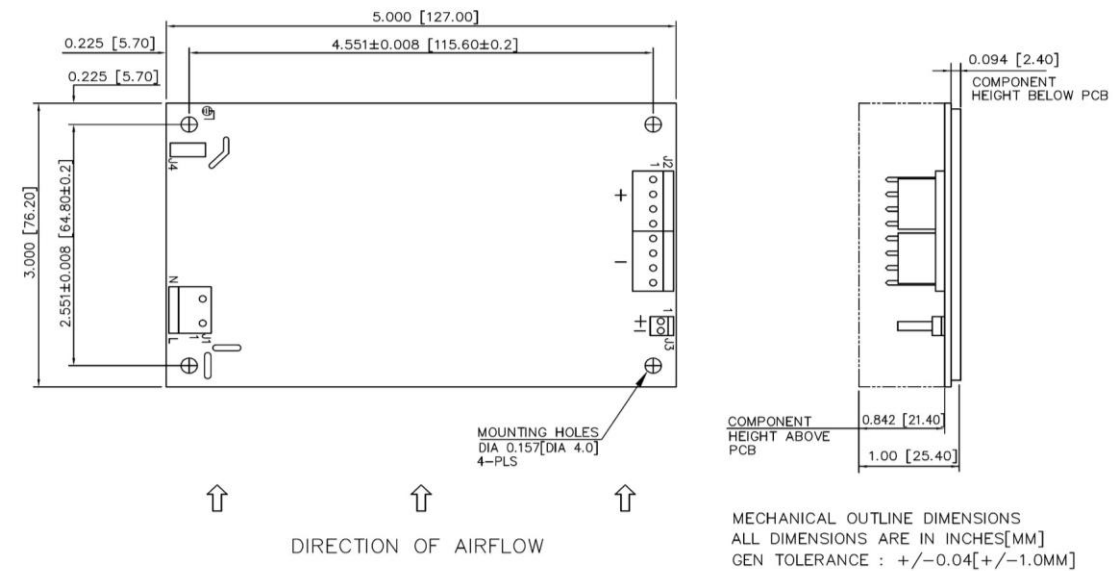


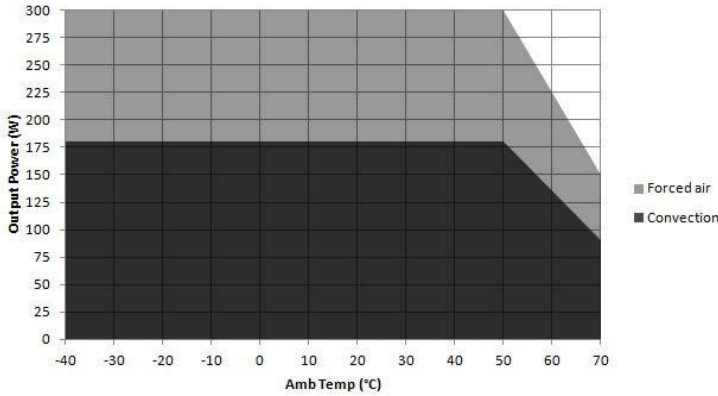
Figure 2. Mechanical Drawing - Molex Header (Option 2)

**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

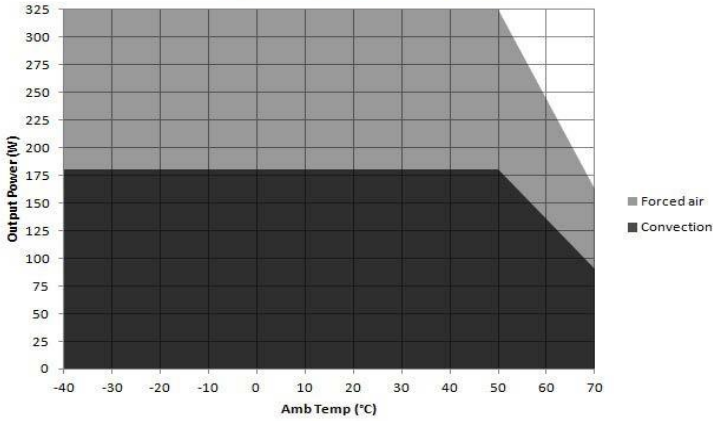
Power de-rating : 12V output



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

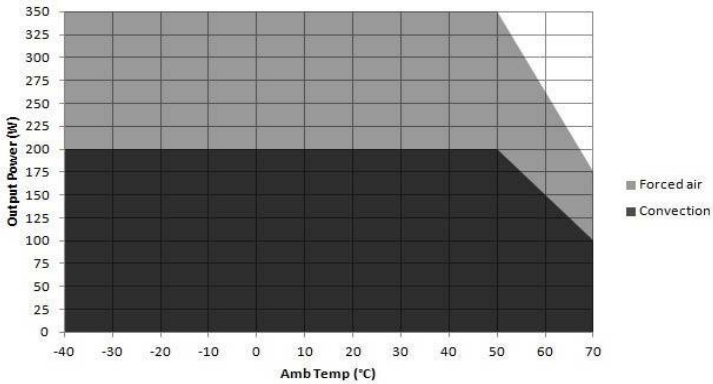
Power de-rating : 15V output



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

Power de-rating : 24V, 30V, 48V, 58V



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

For more information on these products consult: [tech.support@psbel.com](mailto: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.



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Switching Power Supplies](#) category:*

*Click to view products by [Bel Fuse](#) manufacturer:*

Other Similar products are found below :

[70841011](#) [73-551-0005](#) [73-551-0048](#) [PS3E-B12F](#) [PS3E-E12F](#) [AAD600S-4-OP](#) [R22095](#) [KD0204](#) [9021](#) [LDIN100150](#) [LPM000-BBAR-01](#)  
[LPX17S-C](#) [EVS57-10R6/R](#) [FP80](#) [FRV7000G](#) [22929](#) [PS3E-F12F](#) [CQM1IA121](#) [40370121900](#) [VI-PU22-EXX](#) [40370121910](#) [LDIN5075](#)  
[LPM615-CHAS](#) [LPX140-C](#) [09-160CFG](#) [70841025](#) [VPX3000-CBL-DC](#) [VI-LUL-IU](#) [LPM000-BBAR-05](#) [LPM000-BBAR-08](#) [LPM124-](#)  
[OUTA1-48](#) [LPM000-BBAR-07](#) [LPM109-OUTA1-10](#) [LPM616-CHAS](#) [08-30466-1055G](#) [08-30466-2175G](#) [08-30466-2125G](#) [DMB-EWG](#)  
[TVQF-1219-18S](#) [6504-226-2101](#) [CQM1IPS01](#) [SP-300-5](#) [CQM1-IPS02](#) [VI-MUL-ES](#) [22829](#) [08-30466-0065G](#) [VI-RU031-EWWX](#) [08-30466-](#)  
[0028G](#) [EP3000AC48INZ](#) [VP-C2104853](#)