

# MPM-12EPB Series

## Very Low Cost, 12W Compact "Power Brick" AC/DC Power Supplies



### Key Features:

- 12W Output Power
- Compact 1.1 x 2.1 Inch Case
- Universal 85-264 VAC Input
- EN 60950 Approved (UL)
- Meets IEC Safety Class II
- Industry Standard Pin-Out
- Meets EN 55022 Class B
- >300 kHour MTBF
- **Low, Low Cost**



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### Electrical Specifications

Specifications typical @ +25°C, 230 VAC input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

#### Input

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range		85		264	VAC
		110		370	VDC
Input Frequency		47		440	Hz
Input Current	See Model Selection Guide				
Inrush Current	115 VAC		10.0		A Pk
	230 VAC		20.0		

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage	See Model Selection Guide				
Output Current	See Model Selection Guide				
Output Voltage Accuracy			±2.0		%
Line Regulation	V <sub>IN</sub> = Min to Max		±0.5		%
Load Regulation	See Note 2		±1.0		%
Ripple & Noise (20 MHz)				100	mV P-P
Hold-Up Time	115 VAC		10		mSec
	230 VAC		50		
Temperature Coefficient			±0.02		%/°C
Short Circuit Protection	Continuous (Autorecovery)				
Over Voltage Protection	Zener Diode Clamp				
Overload Protection	Autorecovery	110			%W

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Input to Output	4,000			VAC
Isolation Resistance	500 VDC	100			MΩ

#### EMI Characteristics

Parameter	Standard	Min.	Typ.	Max.	Units
Radiated Emissions	EN 55022			Class B	
Conducted Emissions	EN 55022			Class B	
ESD	EN 61000-4-2	Criteria B; ±8 kV Air/±6 kV Contact			
RS	EN 61000-4-3	Criteria A; 10V/m			
EFT	EN 61000-4-4	Criteria B; ±4 kV			
Surge	See Note 4 EN 61000-4-5	Criteria B; ±2 kV			
CS	EN 61000-4-6	Criteria A; 10 Vrms			
PFMF	EN 61000-4-8	Criteria A; 10A/m			
Voltage Dips	EN 61000-4-11	Criteria B; 0% - 70%			
Switching Frequency			100		kHz

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+70	°C
	Case			+90	°C
Storage Temperature Range		-40		+105	°C
Cooling	Free Air Convection (See Derating Curve)				
Humidity	RH, Non-condensing			95	%

#### Physical

Case Size	2.12 x 1.13 x 0.925 Inches (53.8 x 28.8 x 23.50 mm)				
Case Material	Non-Conductive Black Plastic (UL94-V0)				
Weight	2.13 Oz (60g)				

#### Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	300			kHours
Safety Standards	EN 60950				
Safety Class	IEC 60536 Class II				

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Model Number	Input		Output		Standby Power (W, Max)	Capacitive Load ( $\mu$ F Max.)	Efficiency (% Typ)
	Current (A)		Voltage (VDC)	Current (A Max.)			
	115 VAC	230 VAC					
MPM-12S-03EPB	0.280	0.190	3.3	2.400	0.3	10,000	74
MPM-12S-05EPB	0.280	0.190	5.0	2.400	0.3	10,000	78
MPM-12S-12EPB	0.280	0.190	12.0	1.000	0.3	5,400	82
MPM-12S-15EPB	0.280	0.190	15.0	0.800	0.3	2,700	82
MPM-12S-24EPB	0.280	0.190	24.0	0.500	0.3	1,500	83

Notes:

1. Operation at no load will not damage the units, however, they may not meet all specifications.
2. Load regulation is measured for an output change of 10% to 100% at nominal input line.
3. All units are rated for EN 55022 (CE/RE) class B without external components.
4. All units are rated for EN 61000-4-4 ( $\pm 4$  kV) and EN 61000-4-5 ( $\pm 2$  kV) without external components. They will meet EN 61000-4-5 ( $\pm 4$  kV/  $\pm 6$  kV) with additional input filtering as shown below.
5. It is recommended that a fuse be used on the input of a power supply for protection. For the **MPM-12S-xxEPB** series, a 3.15A/250 VAC slow blow should be used.

Typical Connection

The diagram below illustrates a typical application connection of the **MPM-12EPB** series. Notes on this circuit (starting with the input circuit) are:



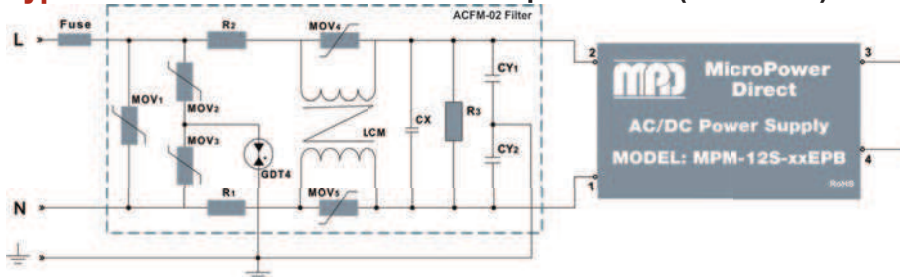
1. It is recommended that an external fuse and NTC be used. The recommended fuse is a 3.15A/250V slow blow and for the NTC, a 5D-9.
2. An external MOV is required on the input to protect the unit in the event of a surge. A 561KD20 or equivalent is recommended.
3. Recommended output filtering capacitors are:

	C1	C2	TVS
MPM-12S-03EPB	1.0 $\mu$ F/50V	220 $\mu$ F/10V	SMBJ7.0A
MPM-12S-05EPB	1.0 $\mu$ F/50V	220 $\mu$ F/10V	SMBJ7.0A
MPM-12S-12EPB	1.0 $\mu$ F/50V	120 $\mu$ F/25V	SMBJ20A
MPM-12S-15EPB	1.0 $\mu$ F/50V	120 $\mu$ F/25V	SMBJ20A
MPM-12S-24EPB	1.0 $\mu$ F/50V	68 $\mu$ F/35V	SMBJ30A

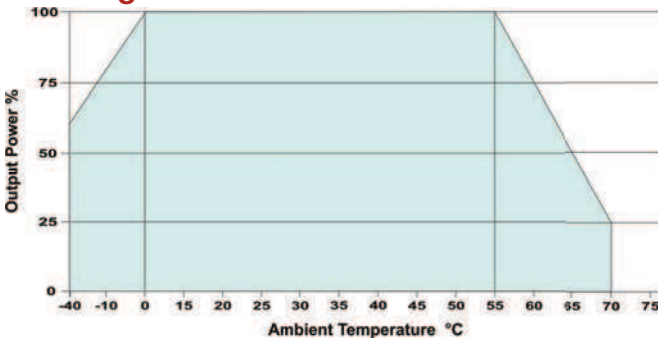
The output filtering capacitor (C2) is a high frequency, low resistance electrolytic capacitor. Capacitor (C1) is ceramic. Voltage derating of capacitors should be 80% or above.

4. Input noise and surge suppression modules are available for a number of MPD AC/DC power supplies. An **MPM-12S-xxEPB** connection with the **ACFM-02** is illustrated in the diagram at left. For pricing or full technical information on these modules (**ACFM-01** and **ACFM-02**) please contact the factory.

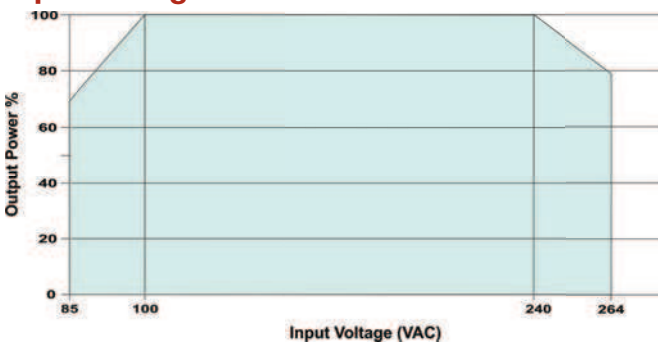
Typical Connection: With ACFM-02 Input Module (See note 4)



Derating Curve



Input Voltage Vs Load

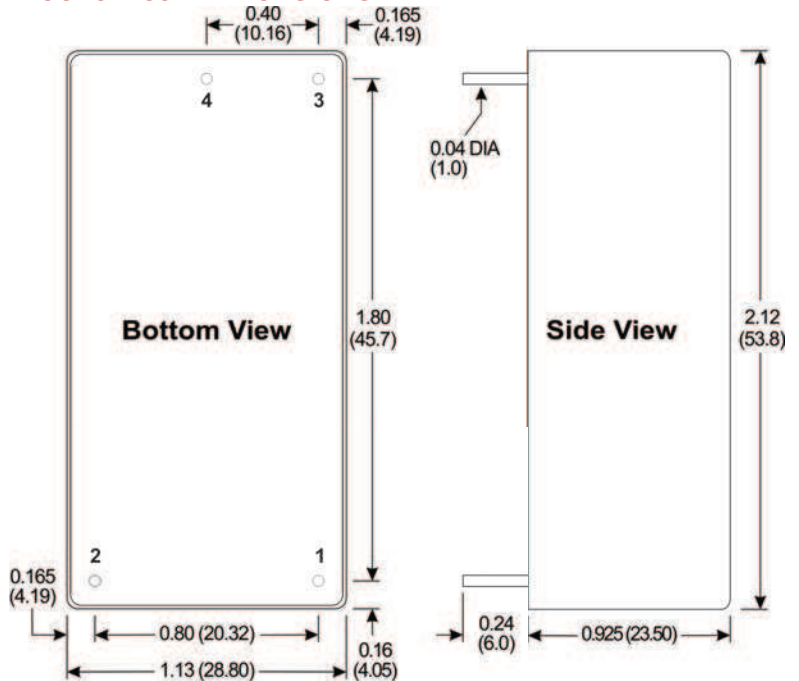


- Notes:
- All dimensions are typical in inches (mm)
  - Tolerance x.xx =  $\pm 0.02$  ( $\pm 0.50$ )

Pin Connections

Pin	Function	Pin	Function
1	AC-Neutral	3	+Vo
2	AC-Line	4	-Vo

Mechanical Dimensions



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The **MPM-20-xxEPB** series is also available with a chassis mount or DIN mount adapter. Contact the factory for more information