MPM-01V Series

Ultra Wide Input, 1W Miniature, Board Mount AC/DC Power Supplies

Key Features:

- 1W Output Power
- Universal 85-305 VAC Input
- EN 60950 Approved (UL)
- Meets IEC Safety Class II
- -25ºC to +70ºC Operation
- Single Regulated Output
- >300 kHour MTBF
- **Ultra-Miniature DIP Case**

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		305	VAC
		120		430	VDC
Input Frequency		47		63	Hz
Input Current	See Model Selection Guide				
Inrush Current	110 VAC		5.0		A Pk
	230 VAC		11.0		
Leakage Current	110/230 VAC			0.15	mA

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage	See Model Selection Guide				
Output Current	See Model Selection Guide				
Output Voltage Accuracy	See Note 1			±5.0	%
Line Regulation	V_{IN} = Min to Max			±2.0	%
Load Regulation	See Note 2			±5.0	%
Ripple & Noise (20 MHz)			100	200	mV Pk - Pk
Hold-Up Time	115 VAC		70		mSec
	230 VAC		300		
Temperature Coefficient			±0.02		%/°C
Short Circuit Protection	Continuous (Autorecovery)				
Over Current Protection	>110% With Autorecovery				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Input to Output	3,000			VAC
EMI/RFI, See Note 3	Conducted	CISPR22/EN 55022 Level B			
	Radiated	CISPR22/EN 55022 Level B			
EMC Compliance	Electrostatic Discharge (ESD)	EN 61000-4-2 Level B 4 kV/8 kV			
	RF Field Susceptibility	EN 61000-4-3 Level A 10V/m			
	Electrical Fast Transients/Bursts On Mains	EN 61000-4-4 Level B 2 kV			
	Surge	EN 61000-4-5 Level B 1 kV/2 kV			
	CS	EN 61000-4-6 Level A 10V rms			
	PFM	EN 61000-4-8 Level A 10A/m			
	Volt. Dips, Short & Inter. Immunity	EN 61000-4-11 Level B 0 - 70%			
Switching Frequency				100	kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-25	+25	+70	°C
Storage Temperature Range		-40		+85	°C
Cooling	Free Air Convection (See Derating Curve)				
Humidity	RH, Non-condensing			90	%

Physical

Case Size	1.327 x 0.874 x 0.708 Inches (33.7 x 22.2 x 18.0 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.70 Oz (20g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	300			kHours
Safety Approvals	UL 60950, EN 60950				
Safety Class	IEC 61140 Class II				

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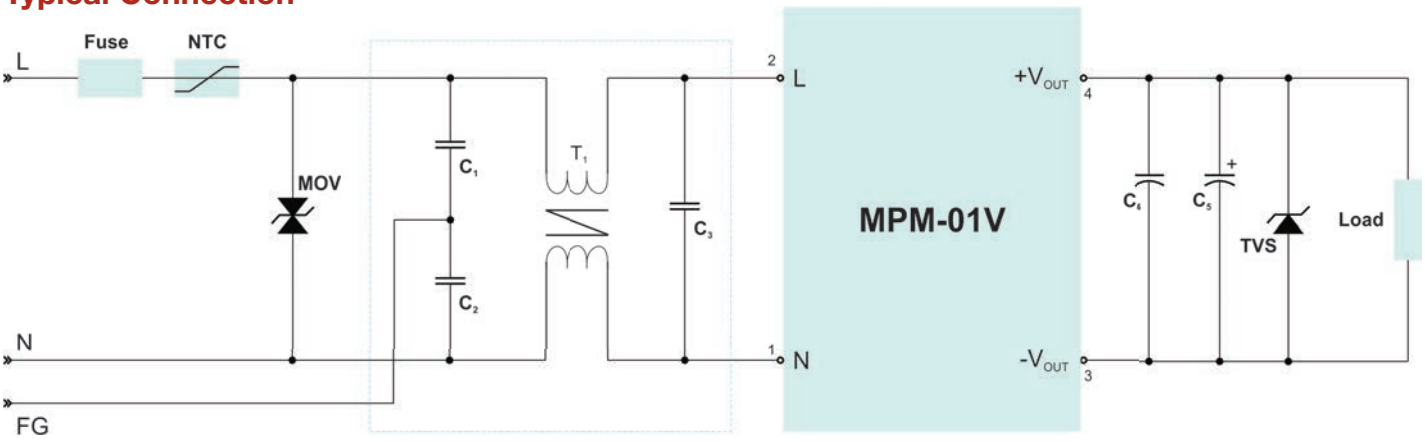
Model Selection Guide

Model Number	Input Current (mA)		Output Voltage (VDC)	Output Current (mA)	Standby Power (W Typ)	Capacitive Load (µF, Max)	Efficiency (%, Typ)
	115 VAC	230 VAC					
MPM-01SV-03	30	17	3.3	300	0.1	4,000	63
MPM-01SV-05	30	17	5.0	200	0.1	4,000	68
MPM-01SV-09	30	17	9.0	111	0.1	2,200	72
MPM-01SV-12	30	17	12.0	83	0.1	2,200	73
MPM-01SV-15	30	17	15.0	67	0.1	1,000	74
MPM-01SV-24	30	17	24.0	42	0.1	680	75

Notes:

1. Output voltage accuracy for 3.3V output models is ±6% Max.
2. Load regulation is measured for an output change of 10% to 100% at nominal input line.
3. The **MPM-01V** meets EN 55022 Class B without external components. For applications where noise sensitivity is critical, a recommended circuit is given below.
4. It is recommended that a fuse be used on the input of a power supply for protection. For the **MPM-01V** series, a 0.5A/250 VAC slow blow should be used.

Typical Connection



The diagram above illustrates a typical application connection of the **MPM-01V** series. Notes on this circuit (starting with the input circuit) are:

1. To maintain clearance and creepage distances (for Class I & Class II devices) the board layout should guarantee the following spacing between the L and N inputs (before the fuse):

   Clearance - 2 mm
   Creepage - 2.5 mm

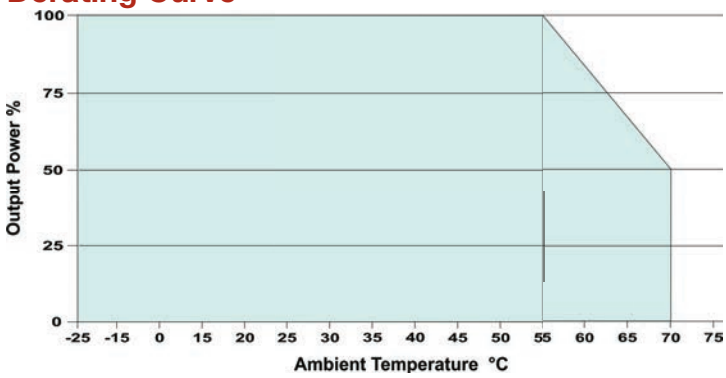
2. The recommended fuse is a 0.5A/250V slow blow. Additionally, a thermistor (NTC) may be used on the input line. A 5D-9 is recommended.
3. For EMI sensitive applications, the input filtering circuit (inside the dotted boxes) may be added. The filter consists of:

   C_X: Capacitor C_3 is 0.1 µF/300V to 0.33 µF/300V
   C_Y: Capacitors C_1 and C_2 are 2200 pF/400V
   T_1: Common mode choke. Inductance is about 10 mH to 30 mH.

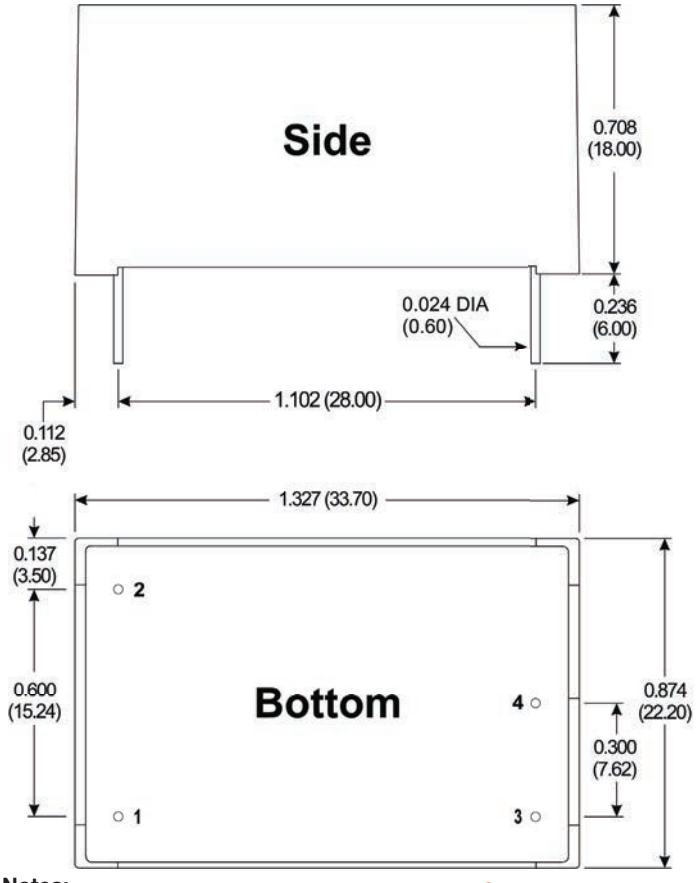
4. The MOV is required for surge protection. Recommended is a 561KD14.
5. The output filtering capacitor (C_5) is a high frequency, low resistance electrolytic capacitor. A ceramic capacitor (C_4) is used to filter high frequency noise. Recommended values are given in the table at right.
6. The TVS is recommended to protect application circuitry in the event of a fault. Recommended values are given in the table at right.

V_{OUT}	C_4	C_5	TVS
3.3	1 µF/50V	220 µF	SMBJ7.0A
5.0	1 µF/50V	220 µF	SMBJ7.0A
9.0	1 µF/50V	120 µF	SMBJ12A
12.0	1 µF/50V	120 µF	SMBJ20A
15.0	1 µF/50V	120 µF	SMBJ20A
24.0	1 µF/50V	68 µF	SMBJ30A

Derating Curve



Mechanical Dimensions



Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.01 (±0.25)

Pin Connections

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

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