

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
- -25°C to +70°C Operation
- Single Regulated Output
- >300 kHour MTBF
- Ultra-Miniature DIP Case



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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 | | 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 | | |
| | Electrostatic Discharge (ESD) | | EN 61000-4-2 Level B 4 kV/8 kV | | |
| EMC Compliance | 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 |

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 | | | | |

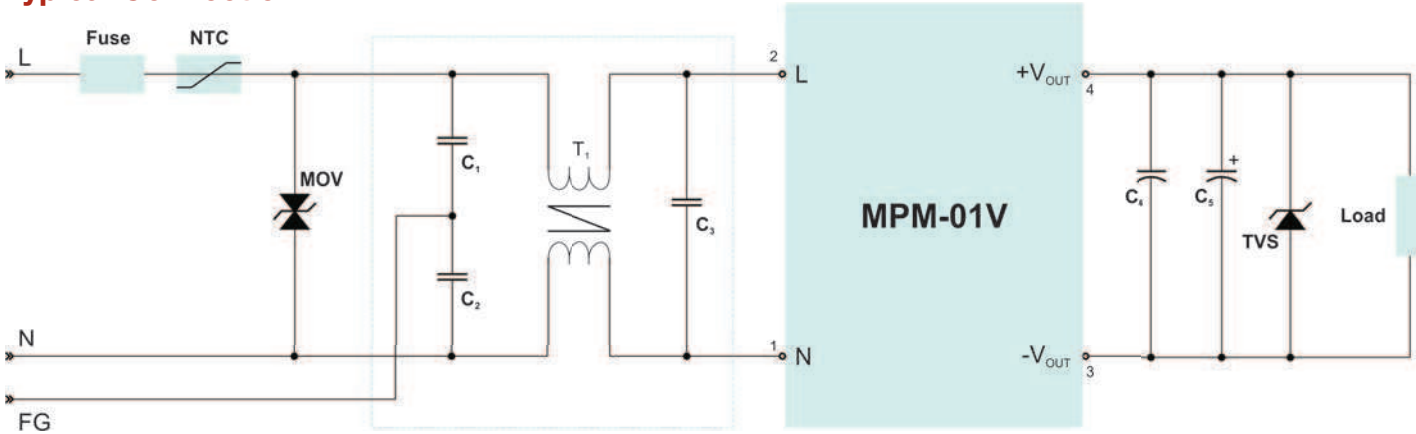
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| Model Number | Input | | Output | | Standby Power (W Typ) | Capacitive Load (μ F, Max) | Efficiency (% Typ) |
|--------------|--------------|---------|---------------|--------------|-----------------------|---------------------------------|--------------------|
| | Current (mA) | | Voltage (VDC) | Current (mA) | | | |
| | 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 $\pm 6\%$ 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



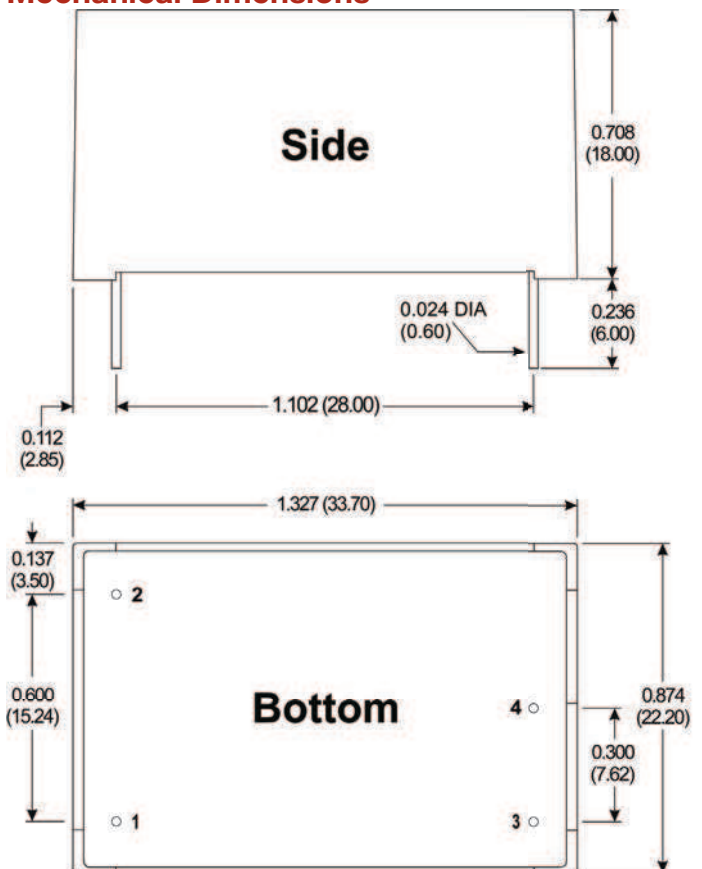
The diagram above illustrates a typical application connection of the **MPM-01V** series. Notes on this circuit (starting with the input circuit) are:

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:
 Cx: Capacitor C₃ is 0.1 μ F/300V to 0.33 μ F/300V
 Cy: Capacitors C₁ and C₂ are 2200 pF/400V
 T₁: 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 (C₃) is a high frequency, low resistance electrolytic capacitor. A ceramic capacitor (C₄) 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 μ F/50V | 220 μ F | SMBJ7.0A |
| 5.0 | 1 μ F/50V | 220 μ F | SMBJ7.0A |
| 9.0 | 1 μ F/50V | 120 μ F | SMBJ12A |
| 12.0 | 1 μ F/50V | 120 μ F | SMBJ20A |
| 15.0 | 1 μ F/50V | 120 μ F | SMBJ20A |
| 24.0 | 1 μ F/50V | 68 μ F | SMBJ30A |

Mechanical Dimensions



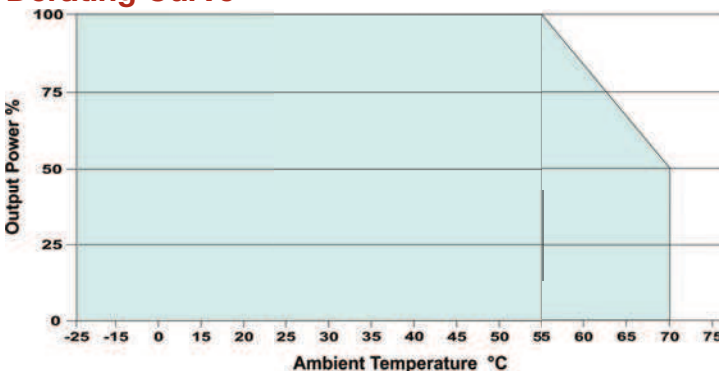
Notes:

- 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 |

Derating Curve



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