

# MPM-10EPB Series

## Very Low Cost, 10W Compact "Power Brick" AC/DC Power Supplies



### Key Features:

- 10W 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 A
- >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)  |                              |      | 50    | 100  | mV P-P |
| Hold-Up Time             | 230 VAC                      |      | 50    |      | mSec   |
| Temperature Coefficient  |                              |      | ±0.02 |      | %/°C   |
| Short Circuit Protection | Continuous (Autorecovery)    |      |       |      |        |
| 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  | See Note 3 EN 55022     |                                     |      |      | Class A |
| Conducted Emissions | See Note 3 EN 55022     |                                     |      |      | Class A |
| ESD                 | EN 61000-4-2            | Criteria B; ±8 kV Air/±6 kV Contact |      |      |         |
| RS                  | EN 61000-4-3            | Criteria A; 10V/m                   |      |      |         |
| EFT                 | See Note 4 EN 61000-4-4 | Criteria B; ±2 kV                   |      |      |         |
| Surge               | See Note 4 EN 61000-4-5 | Criteria B; ±1 kV                   |      |      |         |
| CS                  | EN 61000-4-6            | Criteria A; 10 Vrms                 |      |      |         |
| PFM                 | EN 61000-4-8            | Criteria A; 10A/m                   |      |      |         |
| Voltage Dips        | EN 61000-4-11           | Criteria B; 0% - 70%                |      |      |         |
| Switching Frequency |                         |                                     | 60   |      | kHz     |

#### Environmental

| Parameter                   | Conditions                               | Min. | Typ. | Max. | Units |
|-----------------------------|--|------|------|------|-------|
| Operating Temperature Range | Ambient                                  | -25  | +25  | +70  | °C    |
| Operating Temperature Range | 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 0.75 Inches (53.8 x 28.8 x 28.80 mm) |  |  |  |  |
| Case Material | Non-Conductive Black Plastic (UL94-V0)             |  |  |  |  |
| Weight        | 1.76 Oz (50g)                                      |  |  |  |  |

#### 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-10S-03EPB | 0.230       | 0.150   | 3.3           | 2.000            | 0.40                   | 8,000                           | 70                 |
| MPM-10S-05EPB | 0.230       | 0.150   | 5.0           | 2.000            | 0.40                   | 8,000                           | 74                 |
| MPM-10S-09EPB | 0.230       | 0.150   | 9.0           | 1.100            | 0.45                   | 560                             | 76                 |
| MPM-10S-12EPB | 0.230       | 0.150   | 12.0          | 0.900            | 0.40                   | 1,200                           | 76                 |
| MPM-10S-15EPB | 0.230       | 0.150   | 15.0          | 0.700            | 0.50                   | 1,000                           | 78                 |
| MPM-10S-24EPB | 0.230       | 0.150   | 24.0          | 0.450            | 0.60                   | 200                             | 80                 |

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 A without external components. They will meet EN 55022 class B with additional input filtering as shown below.
4. All units are rated for EN 61000-4-4 ( $\pm 2$  kV) and EN 61000-4-5 ( $\pm 1$  kV) without external components. They will meet EN 61000-4-4 ( $\pm 4$  kV), and EN 61000-4-5 ( $\pm 2$  kV/ $\pm 4$  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-10S-xxEPB** series, a 2.0A/250V slow blow should be used.

Typical Connection

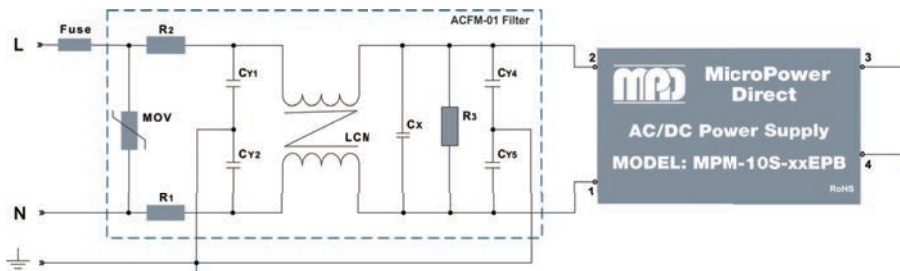
The diagram below illustrates a typical application connection of the **MPM-10EPB** series. Notes on this circuit (starting with the input circuit) are:



1. It is recommended that an external fuse and NTC be used. The recommended fuse is a 2.0A/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 561KD14 or equivalent is recommended.
3. Recommended output filtering capacitors are:

|               | C1              | C2              | TVS      |
|---------------|-----------------|-----------------|----------|
| MPM-10S-03EPB | 1.0 $\mu$ F/50V | 220 $\mu$ F/10V | SMBJ7.0A |
| MPM-10S-05EPB | 1.0 $\mu$ F/50V | 220 $\mu$ F/10V | SMBJ7.0A |
| MPM-10S-09EPB | 1.0 $\mu$ F/50V | 120 $\mu$ F/10V | SMBJ12A  |
| MPM-10S-12EPB | 1.0 $\mu$ F/50V | 120 $\mu$ F/25V | SMBJ20A  |
| MPM-10S-15EPB | 1.0 $\mu$ F/50V | 120 $\mu$ F/25V | SMBJ20A  |
| MPM-10S-24EPB | 1.0 $\mu$ F/50V | 68 $\mu$ F/35V  | SMBJ30A  |

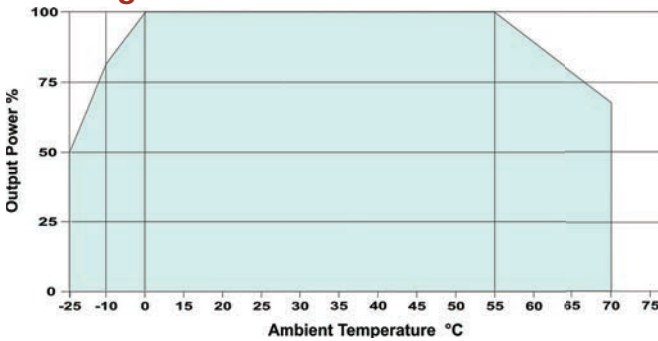
Typical Connection: With ACFM-01 Input Module (See note 4)



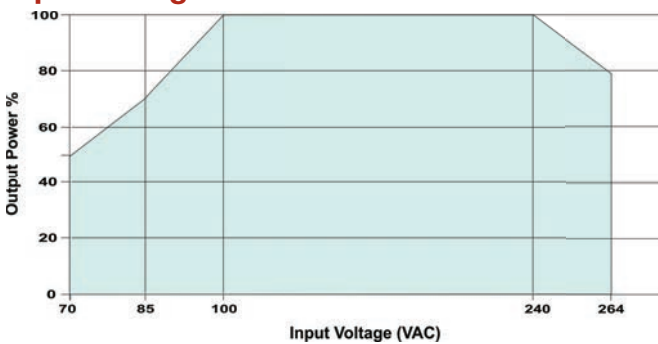
The output filtering capacitor (C2) is a high frequency, low resistance electrolytic capacitor. Capacitor (C1) is ceramic. Voltage derating of capacitors should be 80% or above.

4. Input noise and surge suppression modules are available for a number of **MPD** AC/DC power supplies. An **MPM-10S-xxEPB** connection with the **ACFM-01** 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.

Derating Curve



Input Voltage Vs Load

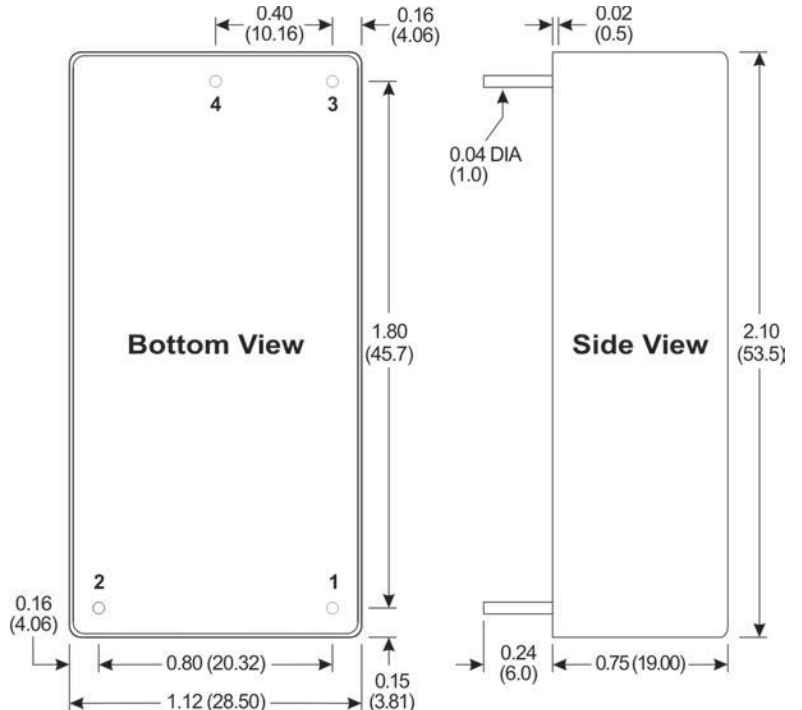


- Notes:
- All dimensions are typical in inches (mm)
  - Tolerance x.xx =  $\pm 0.02$  ( $\pm 0.50$ )

Pin Connections

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

Mechanical Dimensions



The **MPM-10S-xxEPB** series is also available with a chassis mount or DIN mount adapter. Contact the factory for more information