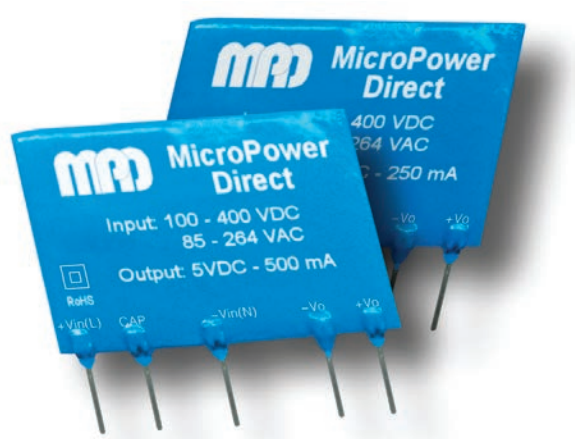
MPS-03 Series

Single Output, 3W Ultra-Miniature SIP AC/DC Power Supplies



Key Features:

- 3W Output Power
- Universal 85-264 VAC Input
- 100 - 400 VDC Input
- Meets IEC Safety Class II
- -40ºC to +85ºC Operation
- Single Regulated Output
- >200 kHour MTBF
- **Ultra-Miniature SIP 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	See Note 1	85		264	VAC
		100		400	VDC
Input Frequency		47		63	Hz
Input Current	See Model Selection Guide				
Inrush Current, See Note 1	115 VAC		10		A
	230 VAC		20		
Leakage Current				50	µA

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	VIN = 10% to 100%		±0.5		%
Load Regulation	See Note 2		±1.0		%
Ripple & Noise (20 MHz)	3.3V And 5V Output Models		50		mV Pk - Pk
	All Other Models		100		
Hold Time, See Note 1	115 VAC	16			mS
	230 VAC	40			
Temperature Coefficient			±0.02		%/°C
Short Circuit Protection	Continuous (Autorecovery)				
Over Temperature Protection	See Note 3			150	°C

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Input to Output	2,000			VAC
Switching Frequency			100		kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Operating Temperature Range	Case			+90	°C
Storage Temperature Range		-40		+105	°C
Cooling	Free Air Convection (See Derating Curve)				
Humidity	RH, Non-condensing			85	%

Physical

Case Size	1.38 x 0.42 x 0.87 Inches (35.0 x 10.6 x 22.5 mm)
Case Material	Non-Conductive Epoxy (UL94-V0)
Weight	1.24 Oz (35g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	200			kHours
Safety Class	IEC 61140 Class II				

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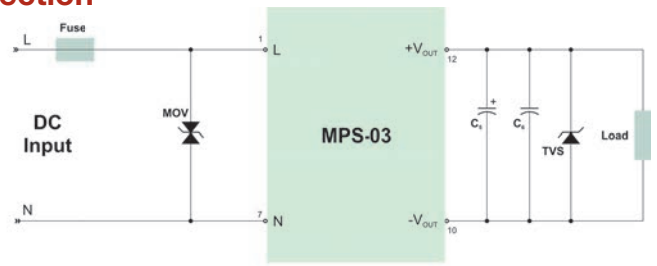
Model Selection Guide

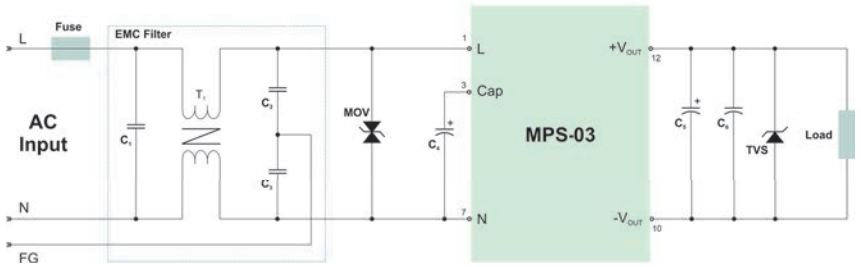
Model Number	Input	Output		Efficiency (%, Typ)
	Current (mA)	Voltage (VDC)	Current (mA)	
MPS-03S-03	40	3.3	500	63
MPS-03S-05	40	5.0	500	72
MPS-03S-09	40	9.0	330	74
MPS-03S-12	40	12.0	250	76
MPS-03S-15	40	15.0	200	76
MPS-03S-24	40	24.0	125	78

Notes:

1. Specified with a C4 (see typical connection diagram at right) value of 22 uF/400V. A high frequency, low impedance electrolytic capacitor should be used. For use with an AC input, C4 must be installed.
2. Load regulation is measured for an output change of 10% to 90% at nominal input line. For multiple output models, the loads are balanced.
3. The unit will shut down when the over temperature protection is triggered. The unit will restart when the ambient operating temperature falls below 85ºC.
4. It is recommended that a fuse be used on the input of a power supply for protection. For the **MPS-03** series, a 0.5A/250 VAC slow blow should be used.

Typical Connection





The diagram above illustrates a typical application connection of the **MPS-03** series. The top diagram illustrates a DC/DC converter connection while the bottom diagram show the unit connected as an AC/DC power supply. Notes on these circuits 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.
3. For EMI sensitive applications, the input filtering circuit (inside the dotted boxes of the AC circuit) may be added. The filter consists of:

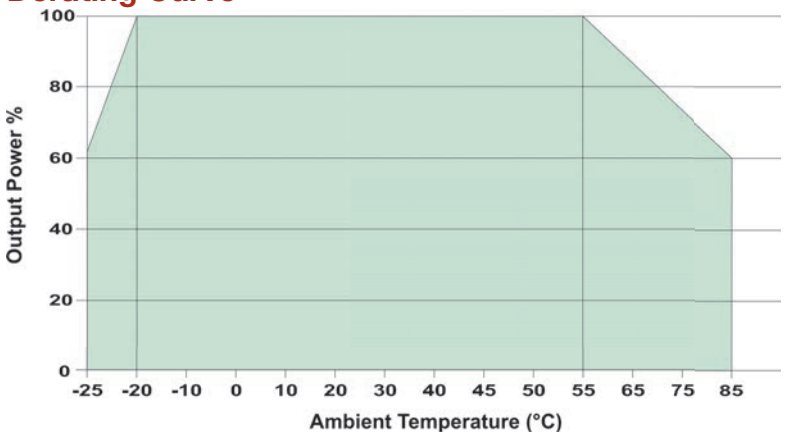
   C_X: Capacitor C_1 is 0.1 μF/275V
   C_Y: Capacitors C_2 and C_3 are 220 pF/2000V
   T_1: Common mode choke, UU9.8 or ring core. Inductance is about 10 mH to 30 mH & wire diameter of 0.22 mm.

4. The MOV is required for surge protection. Recommended is a 471KD07.
5. The input storage capacitor (C_4) is a low ESR electrolytic with a rating of 22 μF /400V. This capacitor must be used for operation with an AC input.
6. The output filtering capacitor (C_5) is a high frequency, low resistance electrolytic capacitor. A ceramic capacitor (C6) is used to filter high frequency noise. Recommended values are given in the table at right.

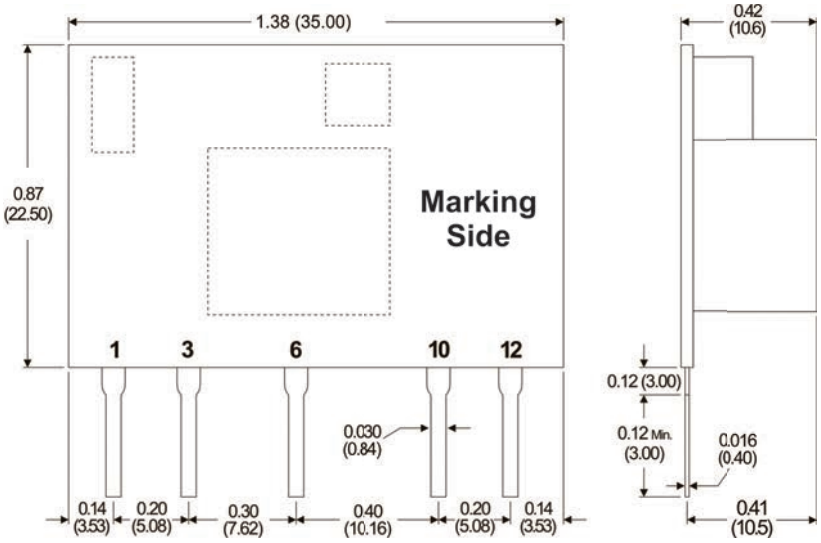
V_{OUT}	C_5 (μF/V)	C_6 (μF/V)	TVS
3.3	150/25	0.1/50	P4KE6.8A
5.0	150/25	0.1/50	P4KE6.8A
9.0	150/25	0.1/50	P4KE12A
12.0	150/25	0.1/50	P4KE20A
15.0	100/35	0.1/50	P4KE20A
24.0	100/35	0.1/50	P4KE33A

7. The TVS is recommended to protect application circuitry in the event of a fault. Recommended values are given in the table above.

Derating Curve



Mechanical Dimensions



Pin Connections

Pin	Function
1	+Vin (AC-Line)
3	CAP
6	-Vin (AC-Neutral)
10	-Vout
12	+Vout

Notes:

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

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