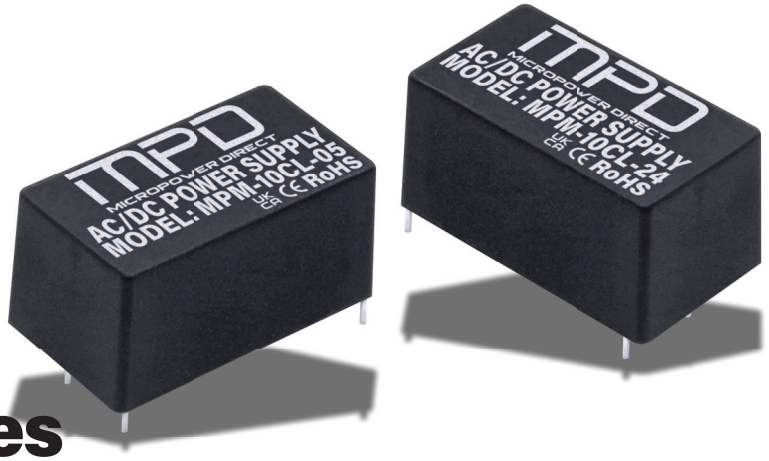
MPM-10CL

High Performance, Very Compact 10W AC/DC,Power Modules



Key Features:

- 10W Output Power
- 4,200 VAC I/O Isolation
- Wide 85-305 VAC Input
- 0.1W No-Load Power
- Meets EN 55032 Class B
- -40°C to 90°C Operation
- Class II Isolation
- OVC III
- Over Voltage Protection
- >3,200 kHour MTBF
- Built In Fuse
- Standard Pin-Out

Electrical Specifications

Specifications typical @ +25°C, nominal 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
		100		430	VDC
Input Frequency		47		63	Hz
Input Current	See Model Selection Guide				
Leakage Current	277 VAC			0.25	mA
Built In Fuse		2A/300V Slow-Blow			
Setup / Rise Time	Full Load	1,000 / 30			mS
Start Up Time, Full Load	115/230 VAC			3,000	mS
Inrush Current, Cold Start	115 VAC		20		A Pk
	230 VAC		40		

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
No Load Power Consumption				0.10	W
Output Voltage Accuracy	3.3V Output		±2.5		%
	All Other Models		±2.0		
Line Regulation	At Rated Load		±0.3		%
Load Regulation, 0 - 100% Load			±0.5		%
Ripple & Noise (20 MHz), See Note 1			100	180	mV P-P
Hold-Up Time	115 VAC		8.0		mSec
	230 VAC		40		
Stand-By Power Consumption, 240 VAC	24 VOUT		0.1	0.12	W
	All Other Models			0.1	
Temperature Coefficient			±0.02		%/°C
Over Current Protection	Self Recovery		≥130		%IOUT
Power Derating	-40°C to -30°C <115 VAC Input	3.30			%/VAC
	+50°C to +70°C, 3.3V/5V	2.50			
	+55°C to +70°C, 12V/15V/24V	3.33			
	+70°C to +90°C	1.00			
	85 VAC - 100 VAC	1.34			%/VAC
	2,000m - 5,000m	6.67			%/km
Short Circuit Protection, See Note 2	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, See Note 3	Input to Output	4,200			VAC
Isolation Resistance, See Note 4	Input to Output	100			MΩ
Impulse Withstand Voltage	Input to Output	6,000			VAC
Switching Frequency			65		kHz

EMI See Page 2

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+90	°C
Storage Temperature Range		-40		+85	°C
Cooling	Free Air Convection (See Derating Curves)				
Humidity, RH, Non-condensing	Working	20		85	%
	Storage			95	

Physical

Size and Weight	See Mechanical Drawing (Page 3)
Case Material	Black Plastic, UL 94V-0, Heat Resistant

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3,200			kHours
Vibration	10-500 Hz, 5G 10 min/1 cycle, 60 min each along X, Y, Z axis				
Isolation Class	Class II				

MicroPower Direct
46 Eastman Street
Unit 1
Easton, MA 02375
USA

T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerdirect.com
W: www.micropowerdirect.com

MICROPOWER DIRECT

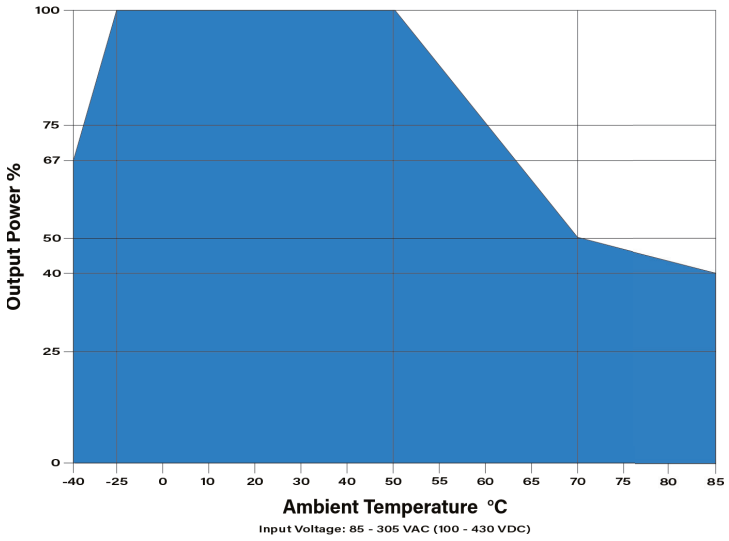
Model Selection Guide

Model Number	Input		Output			Over Voltage Protection (VDC) See Note 5	Efficiency %	Max. Capacitive Load (μF)	Rated Power (W)
	Current (A)		Voltage (VDC)	Current (A)					
	115 VAC	230 VAC		Rated	% Min.				
MPM-10CL-03	0.23	0.15	3.3	2.60	0.00	≤ 7.5	74	6,600	8.60
MPM-10CL-05	0.23	0.15	5.0	2.00	0.00	≤ 7.5	79	5,000	10.00
MPM-10CL-12	0.23	0.15	12.0	0.850	0.00	≤ 16.0	83	2,000	10.00
MPM-10CL-15	0.23	0.15	15.0	0.670	0.00	≤ 20.0	83	1,000	10.00
MPM-10CL-24	0.23	0.15	24.0	0.420	0.00	≤ 30.0	84	680	10.00

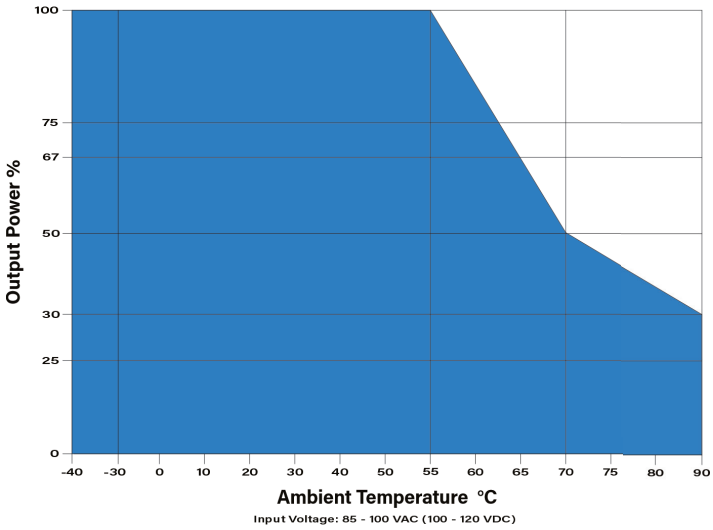
Notes:

1. Output ripple is measured at 20 MHz bandwidth using 0.1 μF and 10 μF capacitors connected in parallel as close to the power supply terminals as possible.
2. Output short circuit protection is provided by a "hiccup mode circuit. The unit recovers automatically when the fault condition is removed.
3. I/O Isolation is tested for 60 seconds. Leakage Current is < 5 mA.
4. Measured at 500 VDC, 25°C and <95% RH.
5. After an overvoltage fault, the unit must be shutdown and repowered when the fault condition is removed.
6. The unit meets EN61000-4-11 levels 0f:
   >95% dip 0.5 periods, 30% dip 25 periods
   >95% interruptions 250 periods

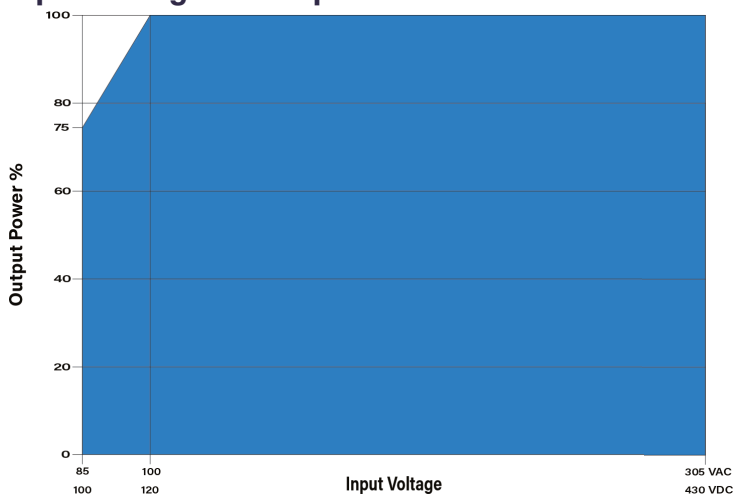
Temperature Vs Output Power - 3.3 & 5.0 VOUT



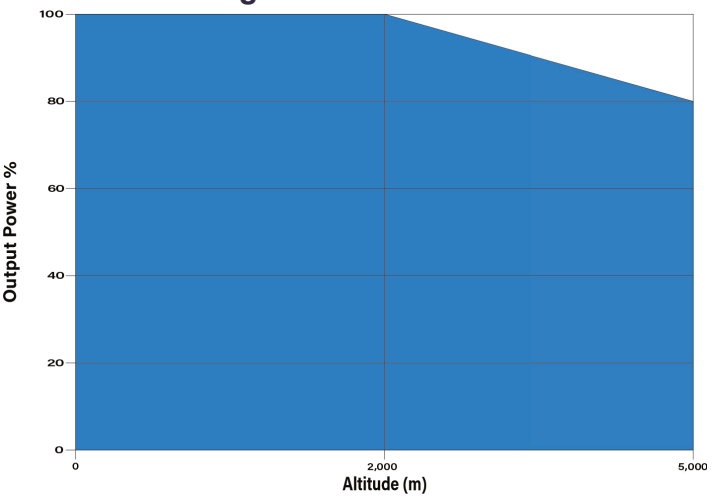
Temperature Vs Output Power-All Other Models



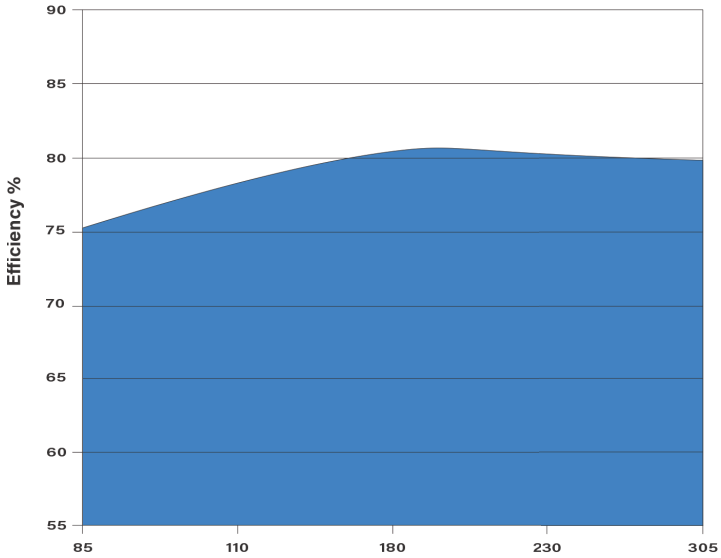
Input Voltage Vs Output Power



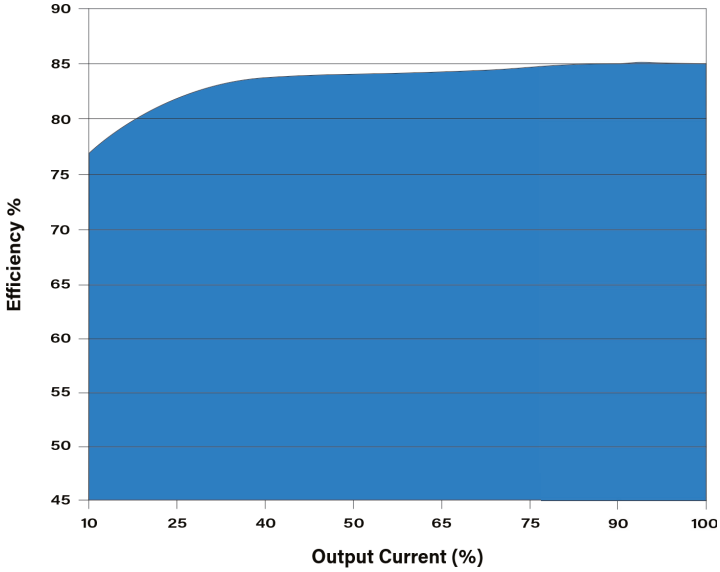
Altitude Derating



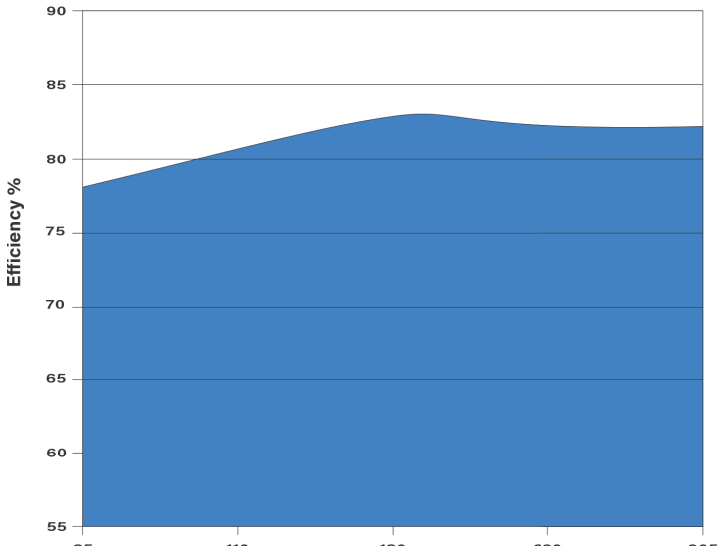
Efficiency vs Input: MPM-10CL-05



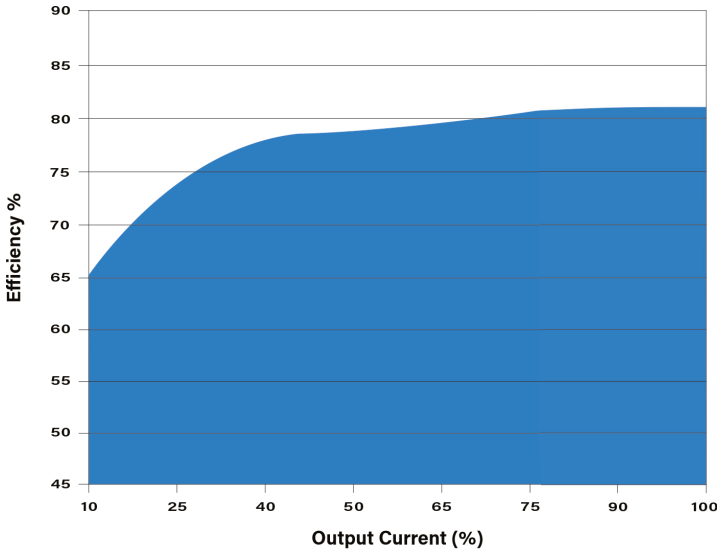
Efficiency vs Output Load: MPM-10CL-05



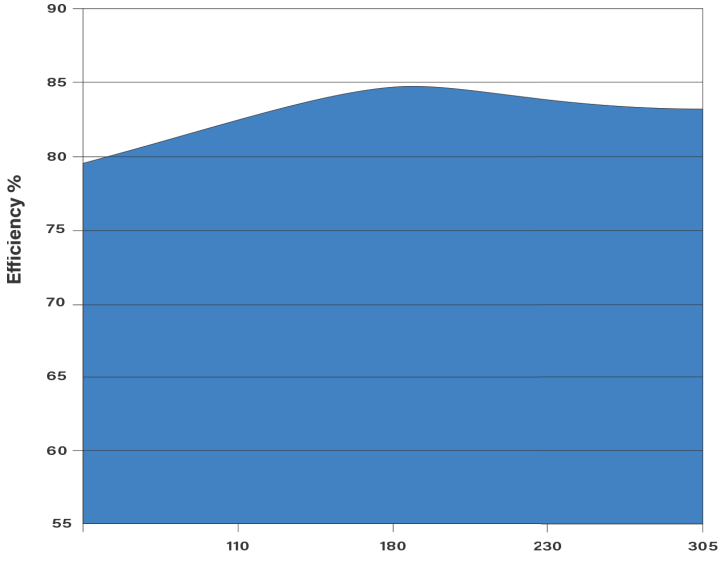
Efficiency vs Input: MPM-10CL-12



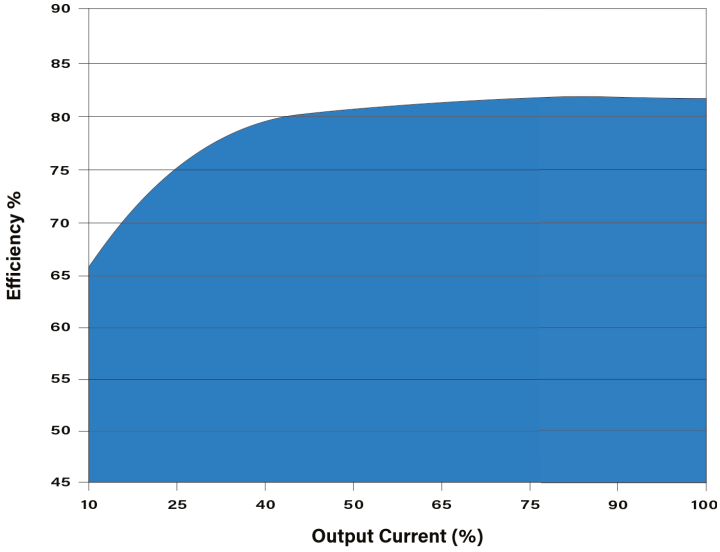
Efficiency vs Output Load: MPM-10CL-12



Efficiency vs Input: MPM10CL-24



Efficiency vs Output Load: MPM-10CL-24



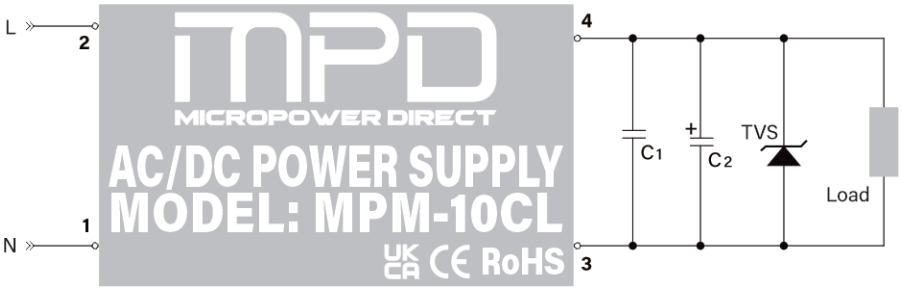
EMI/RFI

Parameter	Standard	Criteria	Level
Radiated Emissions	CISPR 32/EN 55032		Class B
Conducted Emissions	CISPR 32/EN 55032		Class B
ESD	EN 61000-4-2	A	±6 kV Contact
			±8 kV Air
RS	EN 61000-4-3	A	10V/m
Burst	EN 61000-4-4	A	±2 kV
Surge	EN 61000-4-5	A	±1 kV L-L
CS	EN 61000-4-6	A	10V r.m.s
Magnetic Field	EN 61000-4-8	A	30 A/m
Voltage Variations (See Note 6)	EN 61000-4-11	B	70% un,25/30 Cycles (50/60Hz)
			40% un,10/12 Cycles (50/60Hz)
			0% un, 1 Cycle
Voltage Interruptions	EN 61000-4-11	C	0% un,250/300 Cycles (50/60Hz)

Notes:

1. Output ripple is measured at 20 MHz bandwidth using 0.1 μF and 10 μF capacitors connected in parallel as close to the power supply terminals as possible.
2. Output short circuit protection is provided by a "hiccup mode circuit. The unit recovers automatically when the fault condition is removed.
3. Isolation is tested for 60 seconds
4. Measured at 500 VDC, 25C and 70% RH.
5. After an overvoltage fault, the unit must be shutdown and repowered when the fault condition is removed.
6. Un is the maximum input nominal voltage.

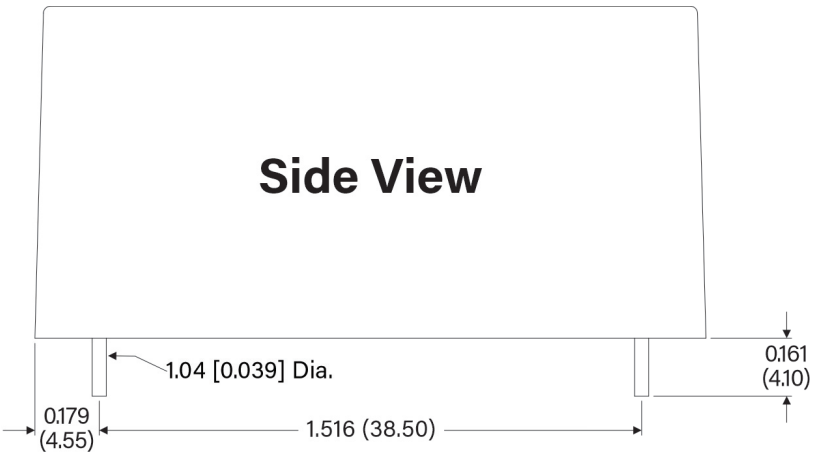
Typical Application Connection

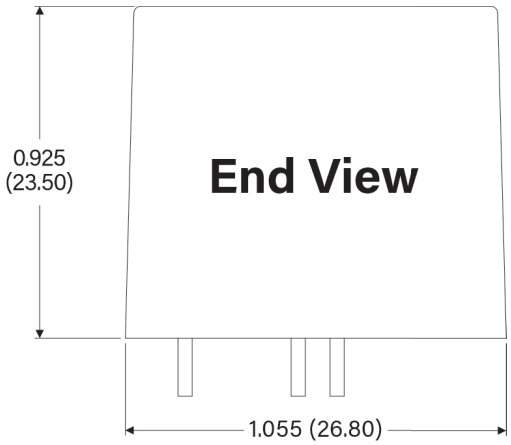


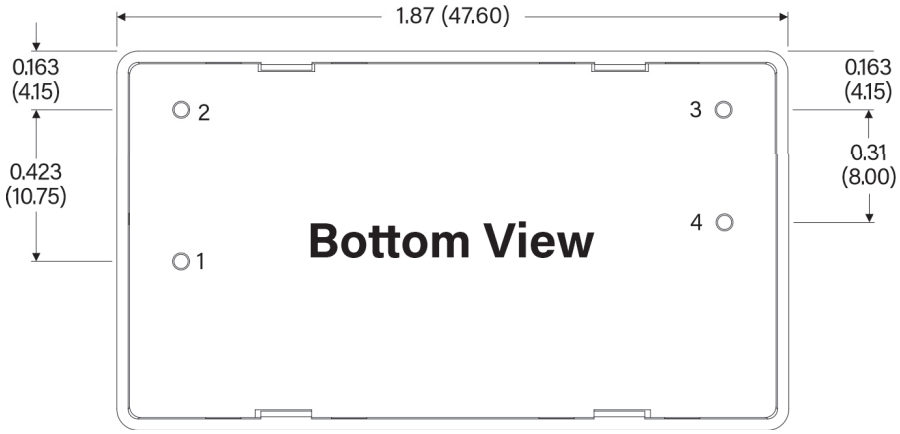
The diagram at left illustrates a typical application circuit for the **MPM-10CL** series.

Model	C1	C2	TVS
MPM-10CL-03	1 μF/50V	220 μF/16V	SMBJ7.0A
MPM-10CL-05		220 μF/16V	SMBJ7.0A
MPM-10CL-12		100 μF/25V	SMBJ20A
MPM-10CL-15		100 μF/25V	SMBJ20A
MPM-10CL-24		100 μF/35V	SMBJ30A

Mechanical Dimensions







Pin Connections

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

Notes:

- All dimensions are typical in inches (mm)
- General Tolerance = ±0.02 (±0.50)
- Pin Tolerance = ±0.004 (±0.10)
- Recommended pin hole size (on the application PC Board) is Ø 0.055 (Ø1.40)
- Weight (Typ) = 1.59 Oz (45g)