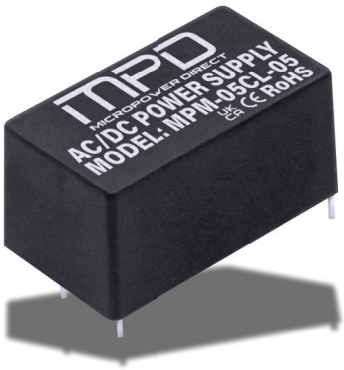
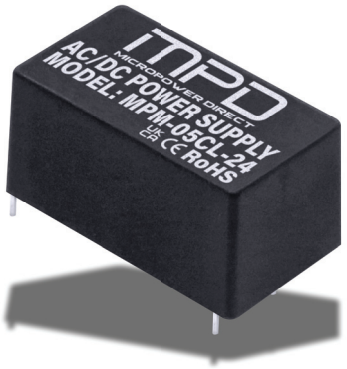
MPM-05CL

High Performance, Very Compact, 5W AC/DC Power Modules





Key Features:

- 5W Output Power
- 4,000 VAC I/O Isolation
- 85-305 VAC Input
- Built In Fuse
- EN 62368 Approved (UL)
- Meets EN 55032 Class B
- -40°C to 85°C Operation
- Standard Pin Out
- Over Current Protection
- Over Voltage Protection
- >1,500 kHour MTBF

CE
UKCA
RoHS

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/50 Hz			0.25	mA
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		15		A Pk
	230 VAC		30		
Built In Fuse	Slow Blow		1A/300V		

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
No Load Power Consumption			0.10	0.15	W
Output Voltage Accuracy			±2.0		%
Line Regulation	At Rated Load		±0.3	±0.5	%
Load Regulation, 0 - 100% Load			±0.5	±1.0	%
Ripple & Noise (20 MHz), See Note 1			50	100	mV P-P
Hold-Up Time	115 VAC		18		mSec
	230 VAC		100		
Temperature Coefficient			±0.02		%/°C
Over Current Protection		120			%IOUT
Short Circuit Protection, See Note 2	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, See Note 3	Input to Output	4,000			VAC
Isolation Resistance, See Note 4	Input to Output		100		MΩ
Switching Frequency			50/60		kHz

EMI See Page 2

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Storage Temperature Range		-40		+105	°C
Cooling	Free Air Convection (See Derating Curves)				
Humidity, RH, Non-condensing	Storage			95	%

Physical

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

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1,080			kHours
Vibration	10-500 Hz, 5G 10 min/1 cycle, 60 min each along X, Y, Z axis				
Isolation Class	Class II				

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MPD
MICROPOWER DIRECT

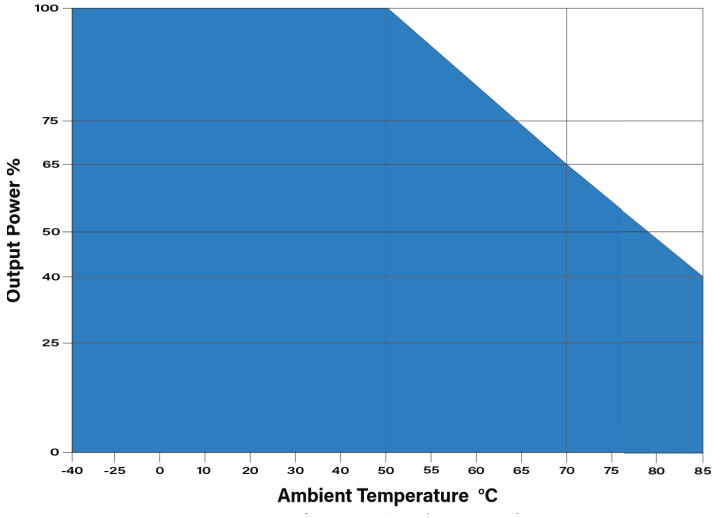
Model Selection Guide

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-05CL-03	0.13	0.07	3.3	1.50	0.00	≥7.5	71.5	4,000	4.95
MPM-05CL-05	0.13	0.07	5.0	1.00	0.00	≥7.5	77.5	3,000	5.00
MPM-05CL-09	0.13	0.07	9.0	0.56	0.00	≥15	80.5	1,200	5.04
MPM-05CL-12	0.13	0.07	12.0	0.42	0.00	≥16	80.5	1,200	5.04
MPM-05CL-15	0.13	0.07	15.0	0.33	0.00	≥20	81.5	680	4.95
MPM-05CL-24	0.13	0.07	24.0	0.23	0.00	≥30	81.5	220	5.52

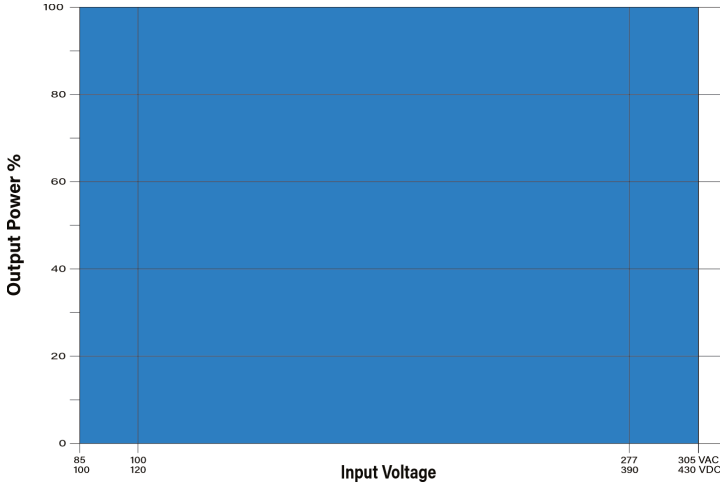
Notes:

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. The unit meets EN61000-4-11 levels 0f:
   >95% dip 0.5 periods, 30% dip 25 periods
   >95% interruptions 250 periods

Temperature Derating



Input Voltage Derating



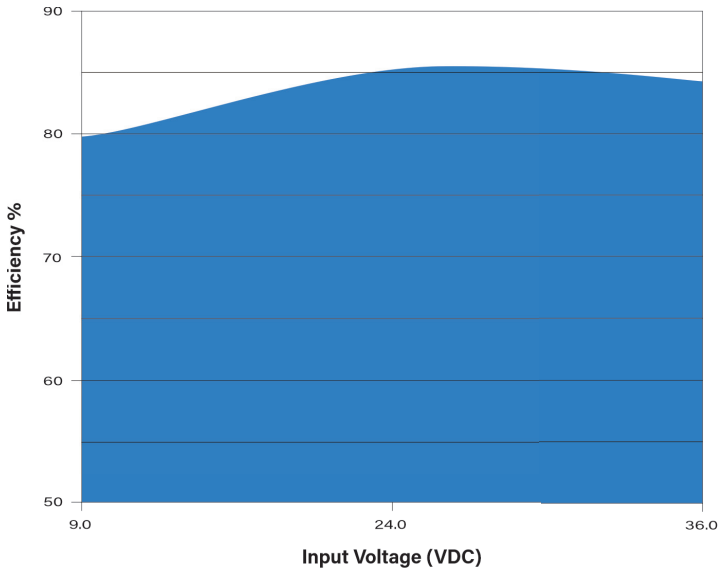
Typical Application Connection

Model	C1	C2	TVS
MPM-05CL-03	1 µF/50V	220 µF/16V	SMBJ7.0A
MPM-05CL-05		220 µF/16V	SMBJ7.0A
MPM-05CL-09		100 µF/25V	SMBJ12A

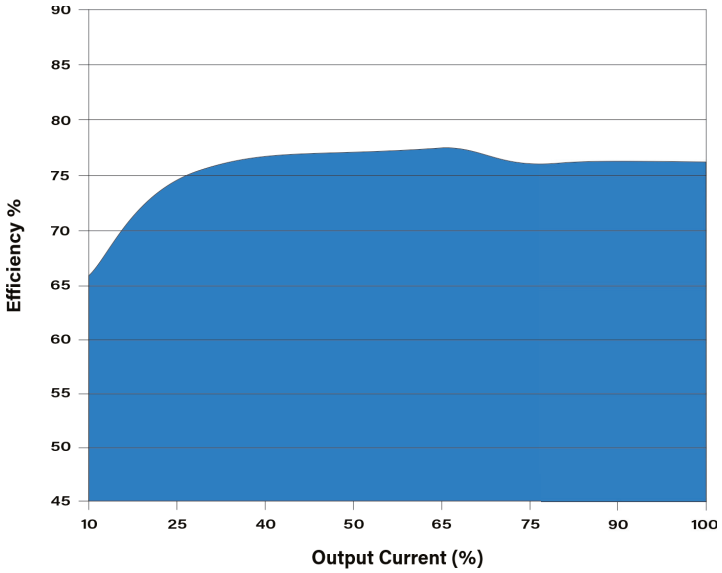
Model	C1	C2	TVS
MPM-05CL-12	1 µF/50V	100 µF/25V	SMBJ20A
MPM-05CL-15		100 µF/25V	SMBJ20A
MPM-05CL-24		100 µF/35V	SMBJ30A

The typical application circuit shown above provides sufficient filtering and surge protection (in case of unit failure for most applications

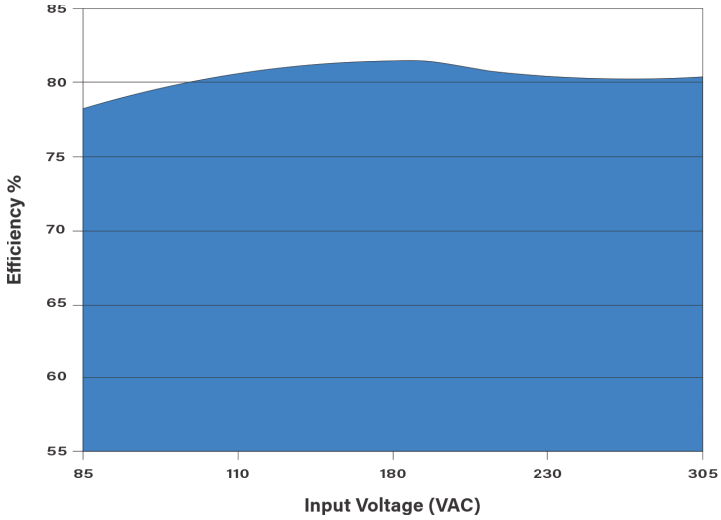
Efficiency vs Input: MPM-05CL-05



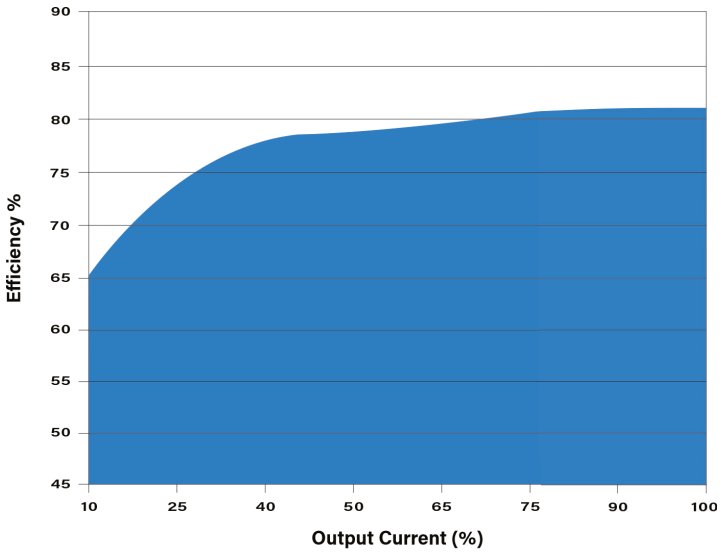
Efficiency vs Output Load: MPM-05CL-05



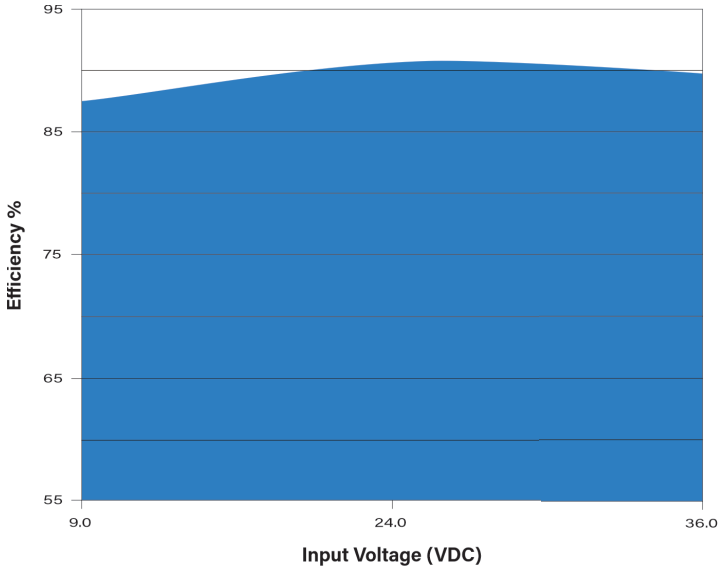
Efficiency vs Input: MPM-05CL-12



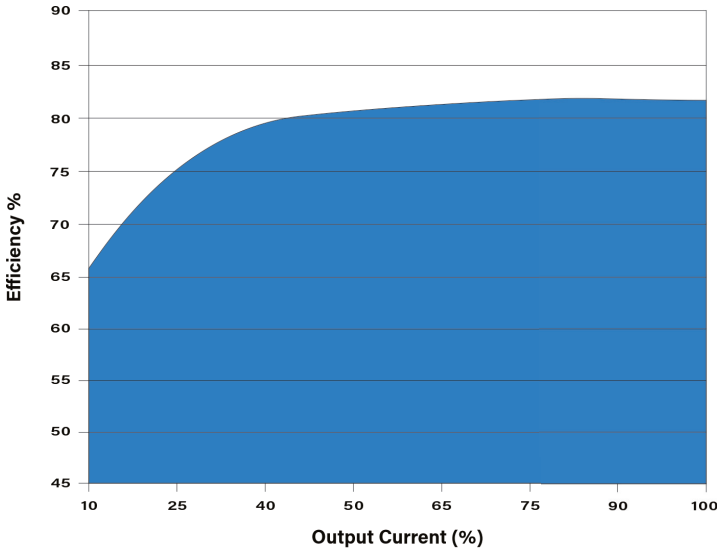
Efficiency vs Output Load: MPM-05CL-12



Efficiency vs Input: MG1224S-24RU



Efficiency vs Output Load: MG1224S-24RU

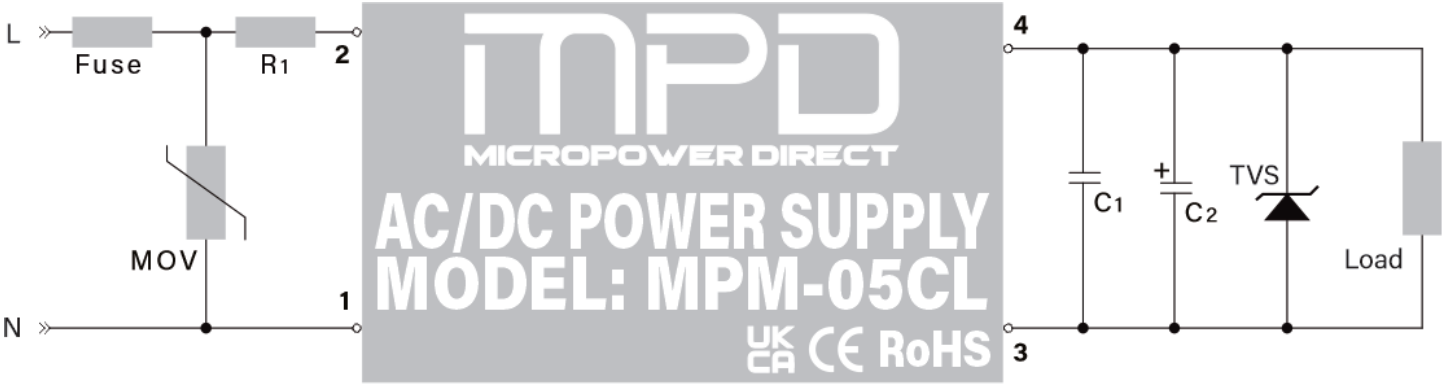


EMI/RFI

Parameter	Standard	Criteria	Level
Radiated Emissions	CISPR32/EN 55032		Class B
	EN55014-1		
Conducted Emissions	CISPR32/EN 55032		Class B
	EN55014-1		
ESD	EN 61000-4-2	A	±6 kV Contact
			±8 kV Air
	EN55014-2	A	
RS	EN 61000-4-3	A	10V/m
	EN55014-2	A	
EFT	EN 61000-4-4	A	±2 kV
			±4 kV
	EN55014-2	A	
Surge	EN 61000-4-5	A	±1 kV
			±2 kV
	EN55014-2	A	
CS	EN 61000-4-6	A	10 Vr.m.s
	EN55014-2	A	
Voltage Dips	EN 61000-4-11	B	0%, 70%
	EN55014-2	B	

To meet EN 55032, external compnents are required. The connection diagram below shows a suggested connection that would typically meet the levels shown at left.

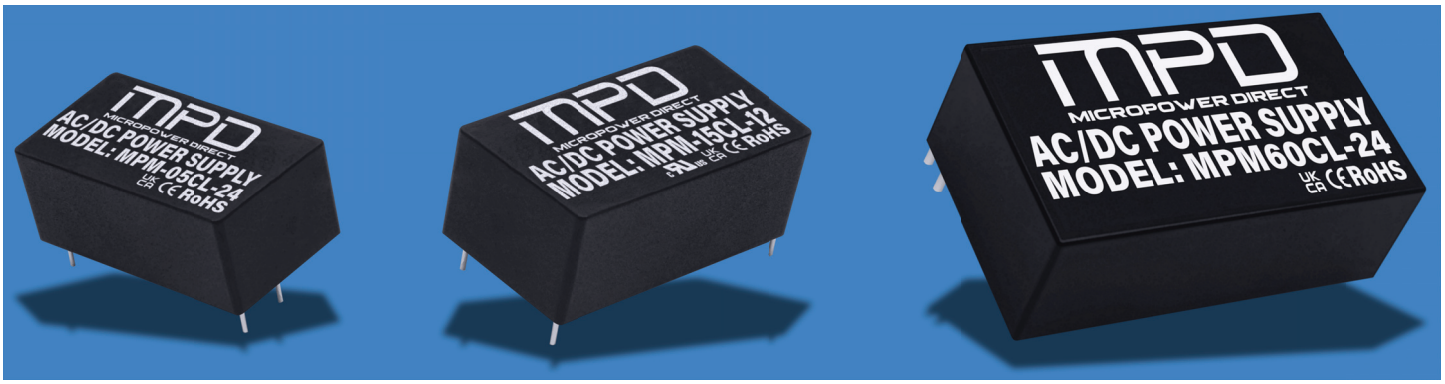
EMI Connection: Class A



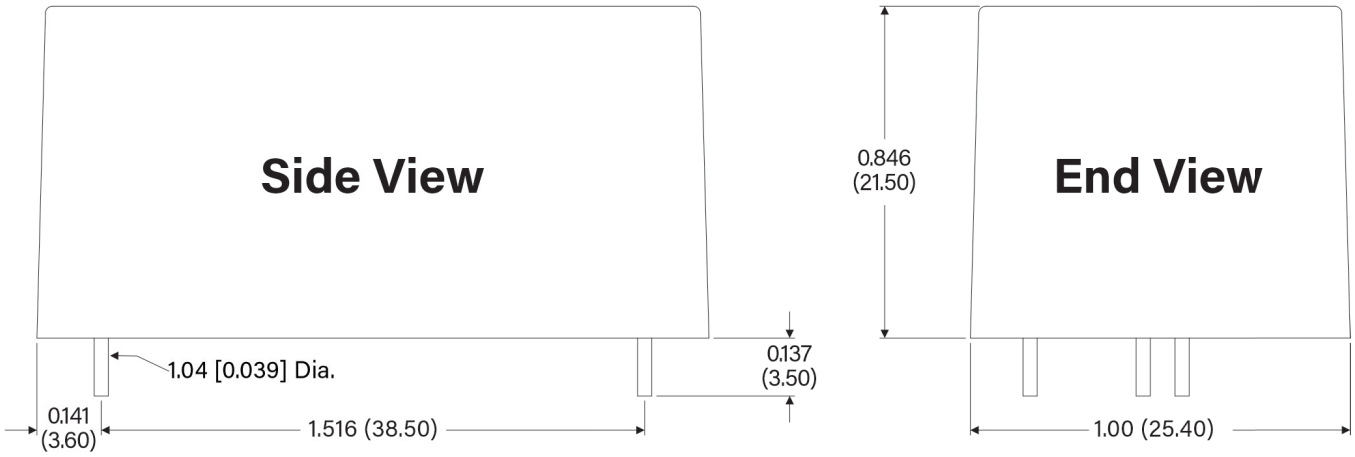
To meet the requirements of EN 55032 class A with the **MPM05CL**, additional external components are required. The connection shown above illustrates an external circuit that will typically meet these requirements.

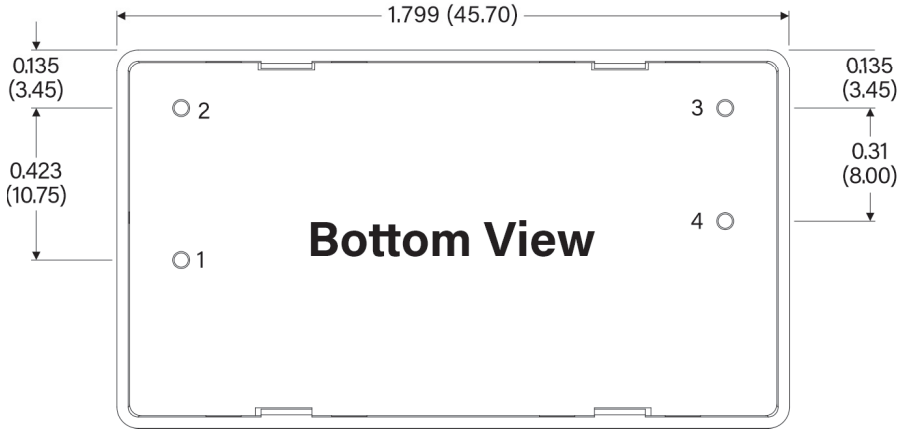
Model	Fuse	MOV	R1	C1	C2	TVS
MPM05CL-03	2A/300V Slow-Blow (Required)	S14K350	12Ω/3W Wire-Wound (Required)	1 μF/50V	220 μF/16V	SMBJ7.0A
MPM05CL-05					220 μF/16V	SMBJ7.0A
MPM05CL-09					100 μF/25V	SMBJ12A
MPM05CL-12					100 μF/25V	SMBJ20A
MPM05CL-15					100 μF/25V	SMBJ20A
MPM05CL-24					100 μF/35V	SMBJ30A

MPD's MPMXCL Series is a series of compact ACDC modules ranging from 5W to 60W. All models offer high performance, high reliability, compact packaging and low cost.



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 0.059 (Ø1.50)
- Weight (Typ) = 1.269 Oz (36g)

MPD has a very wide range of high performance AC/DC power supplies ranging from 600W UChannel units to 1W units in miniature Single-In-Line (SIP) packages. All are designed and certified to international safety and EMC/EMI standards.

We have AC/DC supplies approved for use in medical equipment, DIN rail supplies, "Green" energy supplies and constant power supplies.

We also offer a wide variety of DC/DC converters, LED Drivers, POL regulators and IGBT drivers. All products are available with short lead times. Call today for complete information or product samples. Or go to our website:

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