MCP-02 Series

Compact, Board Mount 2W Constant Power Mode AC/DC Power Supplies



Key Features:

- 2W Output Power
- Constant Power Mode
- Universal 85-264 VAC Input
- EN 60950 Approved (UL)
- Meets IEC Safety Class II
- Meets EN 55022 B
- >500 kHour MTBF

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
		120		370	VDC
Input Frequency		47		440	Hz
Input Surge Voltage				308	VAC
No Load Power Consumption			30		mW

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy, See Note 4	Output 1			±5.0	%
	Output 2			±2.0	
Line Regulation, See Note 5	Output 1		±1.0		%
	Output 2		±0.3		
Load Regulation, See Note 6	Output 1		±1.0		%
	Output 2		±0.5		
Ripple/Noise (20 MHz)	Output 1		1.00		V_{P-P}
	Output 2		100		mV_{P-P}
Short Circuit Protection	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Input to Output	3,000			VAC
Switching Frequency			45		kHz

EMI Characteristics

Parameter	Standard	Criterea	Level
Radiated Emissions	EN 55014-2, EN 55024		Class B
Conducted Emissions	EN 55022		Class B
ESD	EN 61000-4-2	A	±8 kV Air/±4 kV Contact
RS	EN 61000-4-3	A	10V/m
EFT	EN 61000-4-4	A	±2 kV
Surge	EN 61000-4-5	A	±1 kV
CS	EN 61000-4-6	A	10 Vrms
PFMF	EN 61000-4-8	A	30 A/m
Voltage Dips	EN 61000-4-11	A	30% 10 mS
Interruptions	EN 61000-4-11	B	95% 5,000 mS

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-30	+25	+70	°C
Storage Temperature Range		-40		+85	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	See Mechanical Dimensions (Page 2)
Case Material	Non-Conductive Plastic Resin (UL94-V0)
Weight	0.84 Oz (24g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	500			kHours
Safety Standards	UL 60950, EN 60950, EN 60335				
Safety Class	IEC 61140 Class II				

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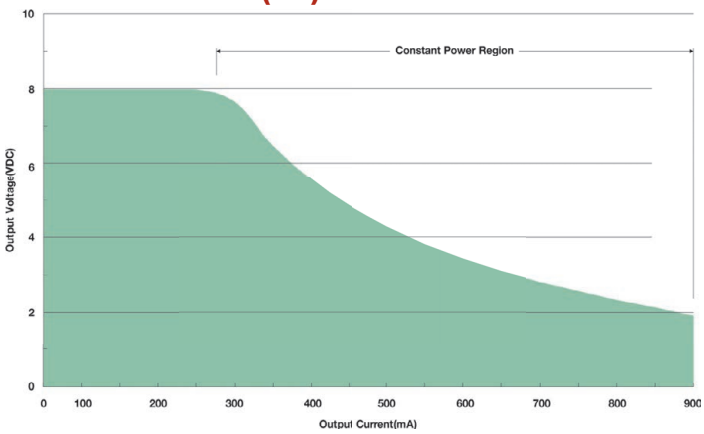
Model Selection Guide

Model Number	Input Current (A)	Output 1 (V_O)		Output 2 (V_R)		Efficiency (%, Typ)
	115 VAC	Voltage (VDC)	Current (mA Max)	Voltage (VDC)	Current (mA Max)	
MCP-02S-08	0.042	8.0	250	---	---	72
MCP-02S-14	0.042	14.0	143	---	---	74
MCP-02S-24	0.042	24.0	83	---	---	76
MCP-02D-0803	0.042	8.0	Note 1	3.3	160	69
MCP-02D-0805	0.042	8.0	Note 1	5.0	250	69
MCP-02D-1403	0.042	14.0	Note 2	3.3	70	70
MCP-02D-1405	0.042	14.0	Note 2	5.0	83	70

Notes:

1. For these models, $I_{OUT1} + I_{OUT2}$ must be $\leq$ 250 mA.
2. For these models, $I_{OUT1} + I_{OUT2}$ must be $\leq$ 143 mA.
3. Output power for dual output models is defined as: $P_{OUT} = V_{OUT1} \times (I_{OUT1} + I_{OUT2})$.
4. Output voltage accuracy is specified at full load & V_{IN} = 115 VAC..
5. Line regulation is specified for VIN = 85 to 264 VAC.
6. Load regulation is specified for IOUT = 10% to 100%.
7. It is recommended that a fuse be used on the input of a power supply for protection. For the **MCP-02x** series, a 1.2A slow blow fuse should be used.

Constant Power (V/I) Curve



The **MCP-02x** operates in constant voltage mode (the same as most AC/DC power supplies) to the point where the maximum output current ratings shown in the tables above are exceeded. When this happens, the typical constant voltage regulated supply will go into current limit and shut down. Unlike conventional current limited designs, the **MCP-02x** cannot be overloaded. As shown in the graph above, the unit will switch to constant power mode and will continue to supply power to the load.

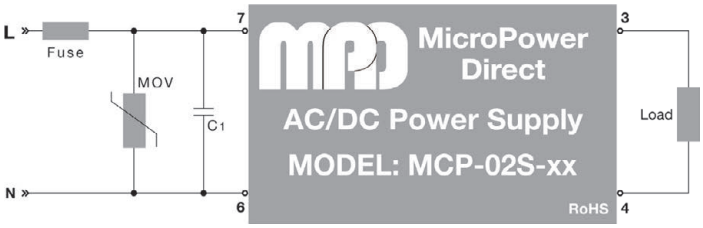
This transition from "constant voltage mode" to "constant power mode" makes the **MCP-02x** especially suitable for applications where current limited designs require "oversizing" the power source to avoid start-up issues. They are well suited for applications that include driving or charging:

- Mechanical Relays
- Solenoids
- Super Caps
- LEDs
- High Capacitive Loads
- Solid State Relays
- Op Amp Drivers

Output 1 (V_O) is voltage regulated until it reaches the "current limit" level. At this point, it transitions to constant power mode. This output cannot be overloaded.

The auxiliary output (V_R) is voltage regulated. It is derived internally from output 1 (V_O).

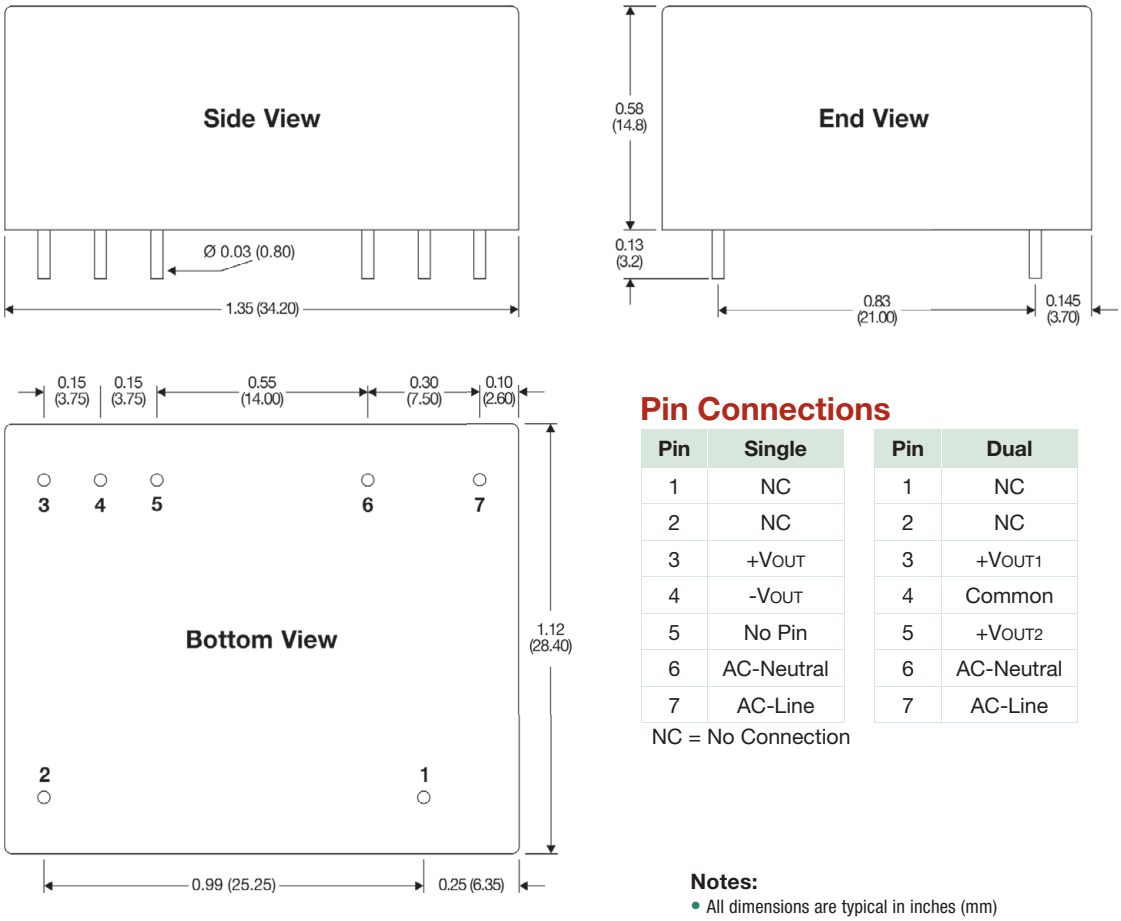
Typical Connection



The **MCP-02x** is designed to be used in industrial/commercial applications where they are connected directly to the power mains. Mains connected components/equipment may be subjected to a wide variety of surge/transient line disturbances. Input line disturbances are covered by the international standards EN-61000-4-2,3,4,5.

The **MCP-02x** series is designed to meet the requirements of EN 61000-4 as shown on page one of this datasheet. For applications that require a higher level of immunity to line disturbances, the addition of external protection components (as shown in the diagram above) may be sufficient. Contact the factory for more information.

Mechanical Dimensions



Pin Connections

Pin	Single
1	NC
2	NC
3	+V_{OUT}
4	-V_{OUT}
5	No Pin
6	AC-Neutral
7	AC-Line

Pin	Dual
1	NC
2	NC
3	+V_{OUT1}
4	Common
5	+V_{OUT2}
6	AC-Neutral
7	AC-Line

NC = No Connection

Notes:

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

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