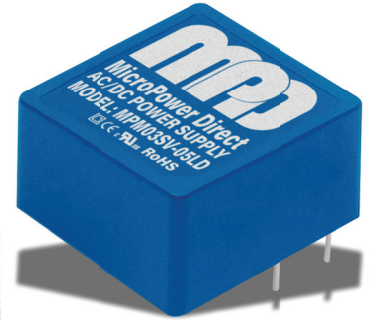


MPM-03SVLD Series

High Performance 3W, Ultra-Wide Input AC/DC Power Supplies



Key Features:

- 3W Output Power
- EN 62368 Approved (UL)
- Universal 85-305 VAC Input
- 4,000 VAC I/O Isolation
- Reinforced Insulation
- Industry Standard Pin-Out
- Meets EN 55032 Class B
- Meets EN 55014
- Chassis Mount Available
- DIN Rail Mount Available
- Low Cost



MicroPower Direct

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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		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 RMS	
Inrush Current	115 VAC		15.0		A Pk	
	230 VAC		25.0			
Output						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Minimum Load	See Note 1	0			%	
Output Voltage Accuracy	3.3 VOUT		±3.0		%	
	All Other Models		±2.0			
Line Regulation	See Note 2		±0.5		%	
Load Regulation	I _{OUT} = 0% to 100%		±1.0		%	
Ripple & Noise (20 MHz)	See Note 3		50	100	mV Pk - Pk	
Standby Power Consumption	230 VAC		0.10		W	
Hold-Up Time	115 VAC		5		mSec	
	230 VAC		50			
Temperature Coefficient			±0.02		%/°C	
Overload Protection	Autorecovery		200		%I _{OUT}	
Short Circuit Protection, See Note 4	Continuous (Autorecovery)					
General						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Isolation Voltage, See Note 5	Input to Output	4,000			VAC	
Switching Frequency			65		kHz	
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 Curve)					
Humidity	RH, Non-condensing			95	%	
Altitude				5,000	m	
Physical						
Case Size	See Mechanical Diagrams (Page 5, 6)					
Case Material	Non-Conductive Black Plastic (UL94-V0)					
Weight	See Mechanical Diagrams (Page 5, 6)					
Reliability Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2,799			kHours	
Safety Standards	UL/cUL 62368-1 recognition (UL certificate)					
	Meets EN 60335, EN 61558					
Design Life, 230 VAC	25 °C, 100% Load				>150 x 10 ³ h	
	70 °C, 100% Load				>27 x 10 ³ h	
Lead Temperature, See Note 6	Wave Solder			260	°C	
	Hand Solder			360		
Safety Class	Class II (Reinforced Insulation)					

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Model Selection Guide

Model Number	Input		Output			Over Voltage Protection (VDC)	Capacitive Load (µF, Max)	Efficiency (230 VAC, %, Typ)	Fuse Rating Slow-Blow
	Current (mA Max)		Voltage (VDC)	Current (mA Max)	Power (W)				
	115 VAC	230 VAC							
MPM-03SV-03LD	80.0	60.0	3.3	900	3.0	7.50	4,000	72	1.0A/300V
MPM-03SV-05LD	80.0	60.0	5.0	600	3.0	7.50	3,000	76	1.0A/300V
MPM-03SV-09LD	80.0	60.0	9.0	333	3.0	15.0	1,200	78	1.0A/300V
MPM-03SV-12LD	80.0	60.0	12.0	250	3.0	16.0	1,200	78	1.0A/300V
MPM-03SV-15LD	80.0	60.0	15.0	200	3.0	20.0	680	79	1.0A/300V
MPM-03SV-24LD	80.0	60.0	24.0	125	3.0	30.0	220	79	1.0A/300V

Notes:

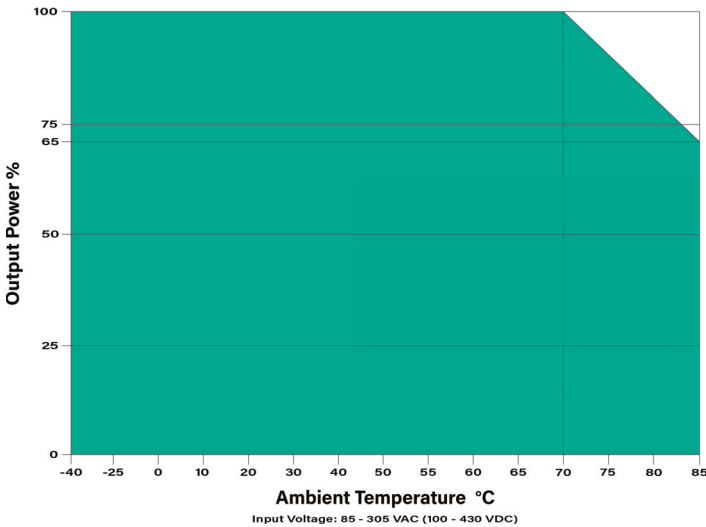
1. Operation at no load will not damage the units, however, they may not meet all specifications.
2. Line regulation is measured with the unit at full load while the input is varied from 85 VAC to 305 VAC.
3. When measuring output ripple, it is recommended that an external 0.1 µF high frequency ceramic capacitor be placed in parallel with a 47 µF high frequency electrolytic capacitor from the +V_{OUT} pin to the -V_{OUT} pin.
4. Output short circuit protection is provided by a "hiccup mode" circuit. The unit recovers automatically when the fault condition is removed.
5. Input-output isolation is tested for 60 seconds with a leakage current of <5 mA.

6. Lead temperature is specified for 5 to 10 seconds for wave soldering with a tolerance of ±5 °C. For manual soldering it is specified for 3 to 5 seconds with a tolerance of ±10 °C.
7. It is recommended that a fuse be used on the input of a power supply for protection. For the MPM-03SVLD series, a 1A/300 VAC slow blow is recommended, but the actual application environment should be checked to insure the proper size is selected.

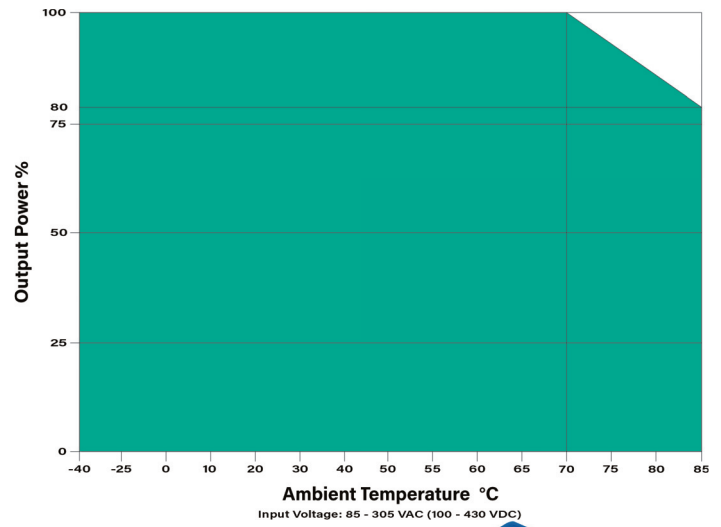
For the A2S adapter board option, add the suffix "-A2S" to the model number (i.e. MPM-03SV-12LD-A2S) See Page 6

For the A4S adapter board option, add the suffix "-A4S" to the model number (i.e. MPM-03SV-05LD-A4S) See Page 6

Temperature Derating: 3.3 VOUT



Temperature Derating: All Other Outputs



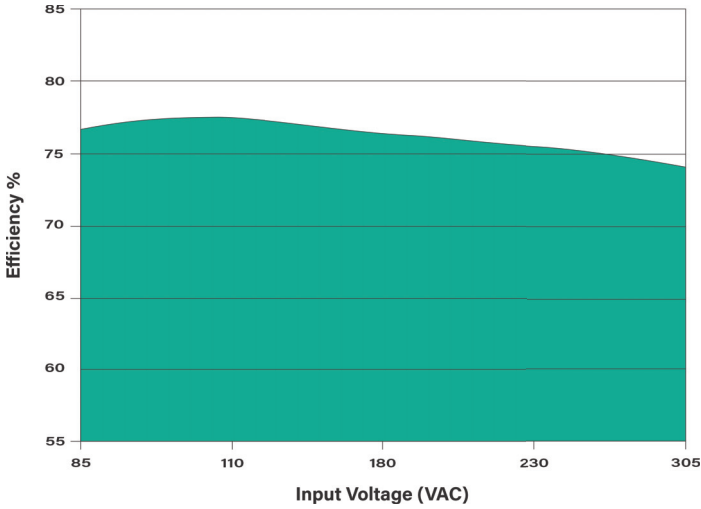
Input Voltage Derating



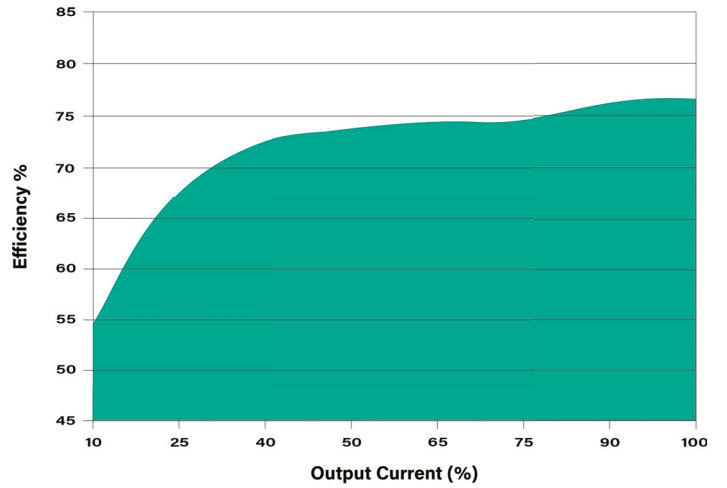
MPD's new MPMSVLD AC power supplies offer small size, low cost and high performance over a power range of 3W to 30W.

For pricing or tech info please contact the factory or visit our website: MICROPOWERDIRECT.COM

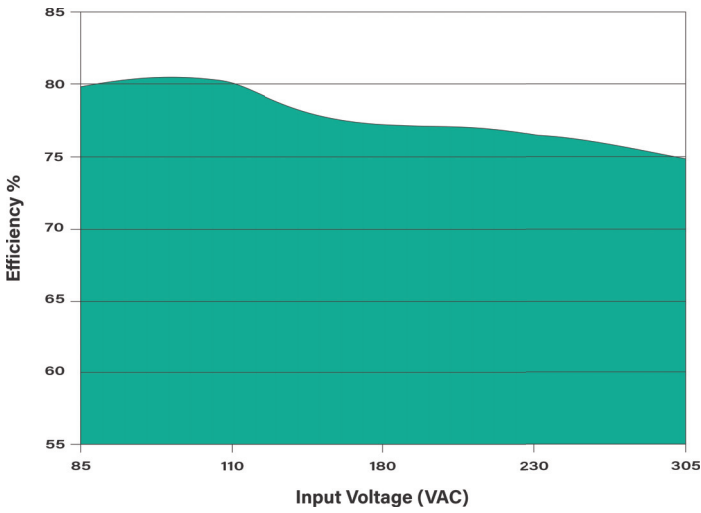
Efficiency vs Input Voltage: 5 VOUT Models



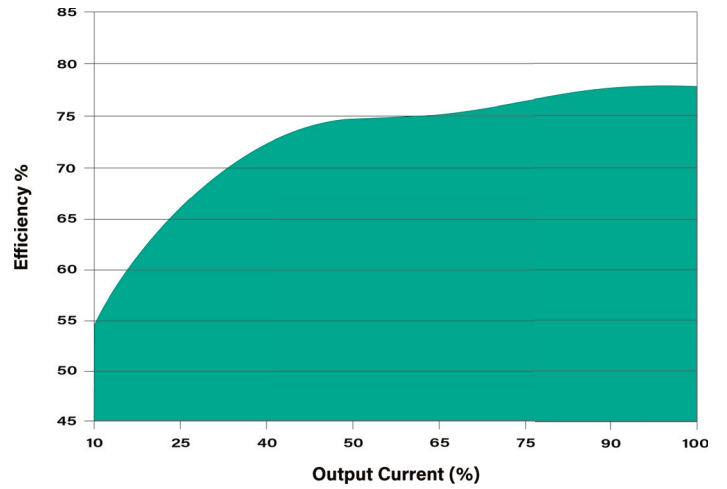
Efficiency vs Output Load: 5 VOUT Models



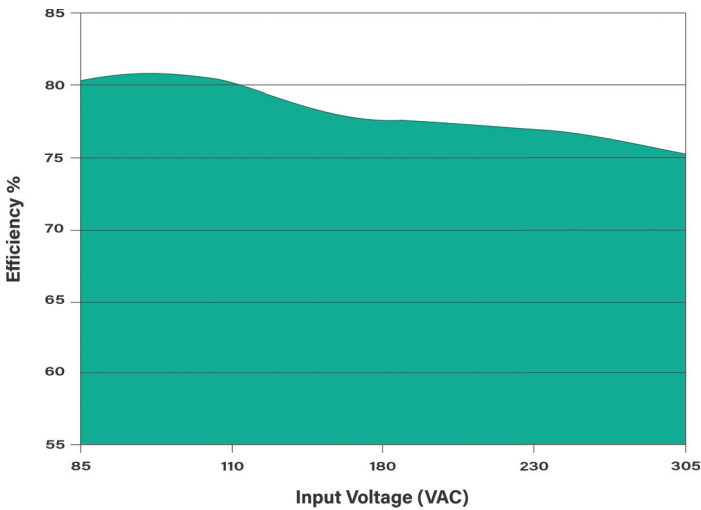
Efficiency vs Input Voltage: 12 VOUT Models



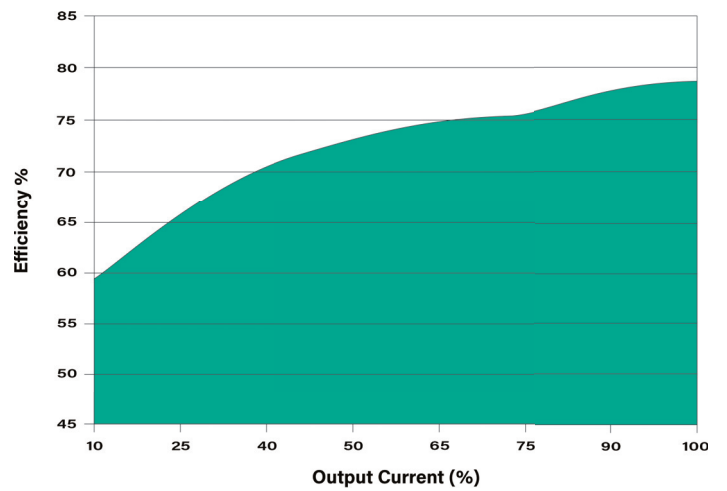
Efficiency vs Output Load: 12 VOUT Models



Efficiency vs Input Voltage: 24 VOUT Models



Efficiency vs Output Load: 24 VOUT Models



EMI Characteristics

Parameter	Conditions	Criteria	Level
Radiated Emissions, See Note 1 At Right	EN 55032		Class B
Conducted Emissions, See Note 1 At Right	EN 55032		Class B
ESD	EN 61000-4-2	B	±8 kV Air
			±6 kV Contact
RS	EN 61000-4-3	A	10V/m
EFT, See Note 2 At Right	EN 61000-4-4	B	±2 kV
			±4 kV
Surge, See Note 3 At Right	EN 61000-4-5	B	±1 kV Line to Line
			±2 kV Line to Line
Surge, See Note 4 At Right	EN 61000-4-5	B	±4 kV Line to Grnd
CS	EN 61000-4-6	A	10V rms
Voltage Dips, Short, Interruptions	EN 61000-4-11	B	0% - 70%

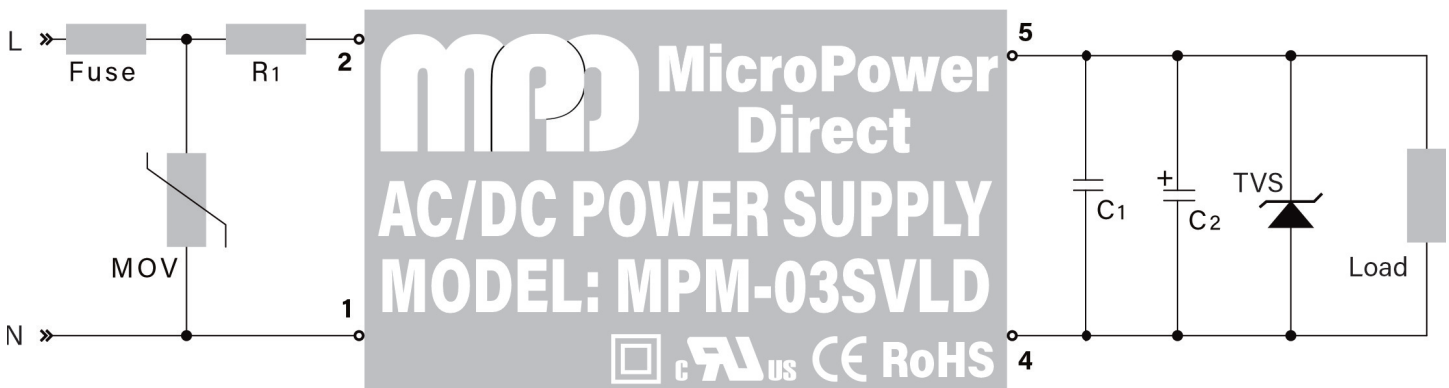
Notes:

- To meet the requirements of EN 55032 class B, use the "Typical Connection" as shown on page 5. If the "Simple Connection" shown below is used, the circuit will typically meet EN 55032 class A. Contact the factory for more information.
- To meet the requirements of EN 61000-4-4 (±2 kV), use the "Simple Connection" as shown below. To meet EN 61000-4-4 (±4 kV) use the "Typical Connection" as shown on page 5. Contact the factory for more information.
- To meet the requirements of EN 61000-4-5 (±1 kV line to line), use the "Simple Connection" as shown below. Contact the factory for more information.
- To meet the requirements of EN 61000-4-5 (±2 kV line to line, ±4 kV line to Grnd), use the "Typical Connection" as on page 5. Contact the factory for more information.

EMI Characteristics: EN 55014

Parameter	Conditions	Criteria
Radiated Emissions	EN 55014-1	
Conducted Emissions	EN 55014-1	
ESD	EN 55014-2	B
RS	EN 55014-2	A
EFT	EN 55014-2	B
Surge	EN 55014-2	B
CS	EN 55014-2	A
Voltage Dips, Short, Interruptions	EN 55014-2	B

Typical Connection



The diagram above illustrates a typical application connection of the MPM-03SVLD series. Notes on this circuit (starting with the input circuit) are:

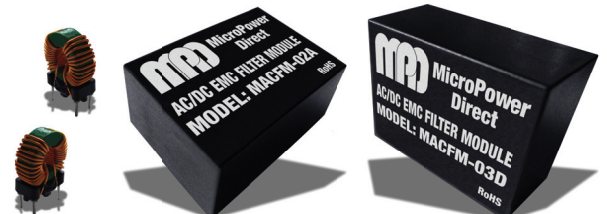
- It is recommended that an external fuse be used. The suggested fuse is a 1.0A/300 VAC slow blow.
- All units are rated for EN 55032 (CE/RE) class B without external components.
- The MOV and R1 provide protection against line spikes and surges. For protection that meets EN 61000-4-4 & EN 61000-4-5 see page 5.
- If output noise levels lower than the specified limits are required, the addition of C1 and C2 should be sufficient for most applications. The recommended values are shown in the table at right. 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.
- The TVS is added to protect circuits being powered from damage if the module fails.

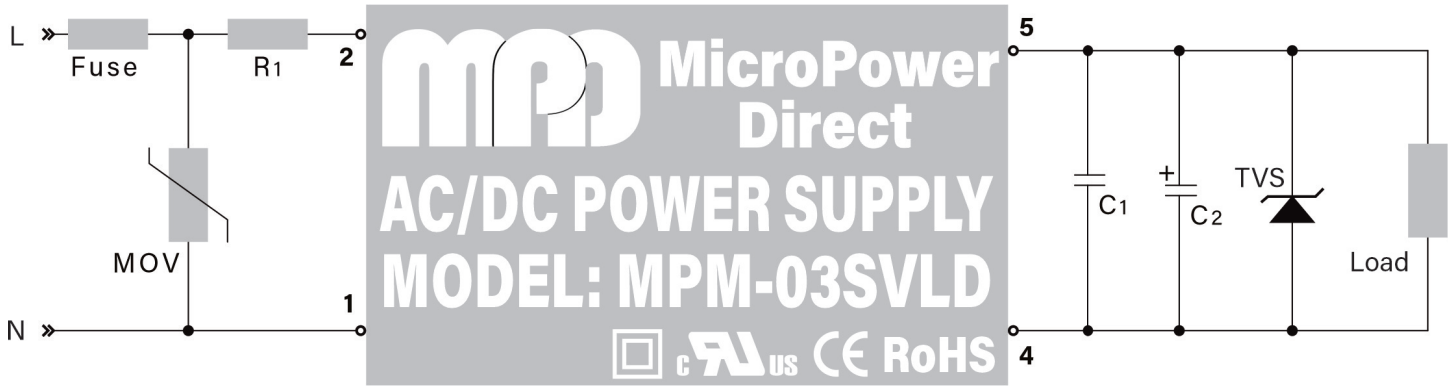
Model	MOV	R1	C1	C2	TVS
MPM-03SV-03LD	S10K350	12 Ω/3W	1.0 μF/50V	150 μF/16V	SMBJ7.0A
MPM-03SV-05LD				150 μF/16V	SMBJ7.0A
MPM-03SV-09LD				120 μF/25V	SMBJ12A
MPM-03SV-12LD				120 μF/25V	SMBJ20A
MPM-03SV-15LD				120 μF/25V	SMBJ20A
MPM-03SV-24LD				68 μF/35V	SMBJ30A

Input Filtering Components

Input protection and filtering modules are available for a number of MPD AC/DC and DC/DC power supplies. These include common mode filters, EMC filters, surge & pulse suppressors, and common mode filters.

For pricing or full technical information on any of our filtering/protection modules please contact the factory.





To use the **MPM-03SVLD** series in an EMC compliant application, the circuit remains the same. However, the input components are changed to meet the more stringent EFT/Surge levels of EN 61000-4 (see notes for EMC Characteristics table on page 4). Some notes on these components are:

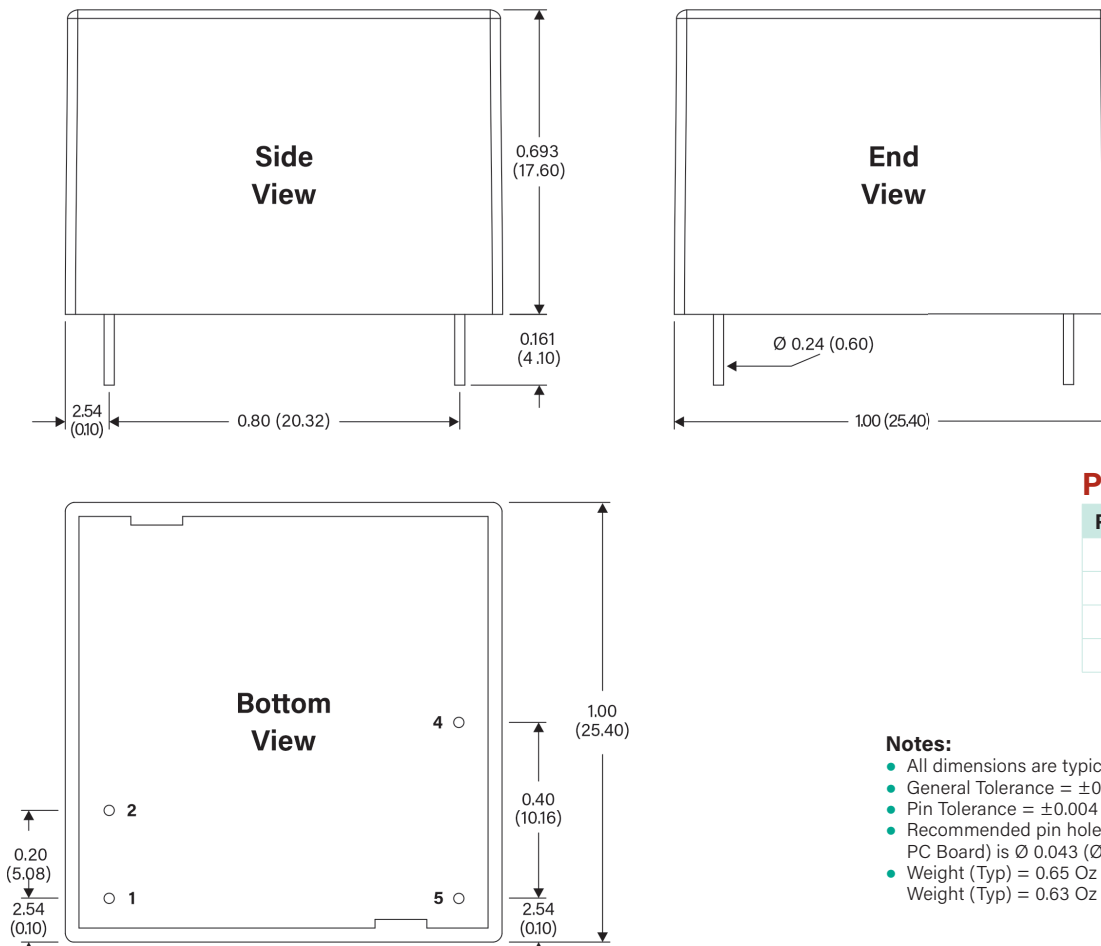
1. The suggested fuse size is increased to a 2.0A/300 VAC slow blow.
2. To meet more stringent levels of EN 61000-4-4 and EN 61000-4-5, the ratings for the input MOV and R1 are also changed. These component values are given in the table at right.
3. The output filtering capacitors (C1 & C2) and TVS are discussed in the notes for the simple connection diagram on page 4.

4. The output filtering capacitors (C1 & C2) and TVS are discussed in the notes for the simple connection diagram on page 3.
5. Suggested component values are:

Component	3.3 Vout	5.0 Vout	9.0 Vout	12 Vout	15 Vout	24 Vout
Fuse	2.0A/300 VAC Slow Blow					
MOV	S14K350					
R1	33 Ω/3W					
C1	1 μF/50V					
C2	150 μF/16V	150 μF/16V	120 μF/25V	120 μF/25V	120 μF/25V	68 μF/35V
TVS	SMBJ7.0A	SMBJ7.0A	SMBJ12A	SMBJ20A	SMBJ20A	SMBJ30A

6. Input protection and filtering modules are available for a number of **MPD** AC/DC power supplies. For pricing or full technical information please contact the factory.

Mechanical Dimensions



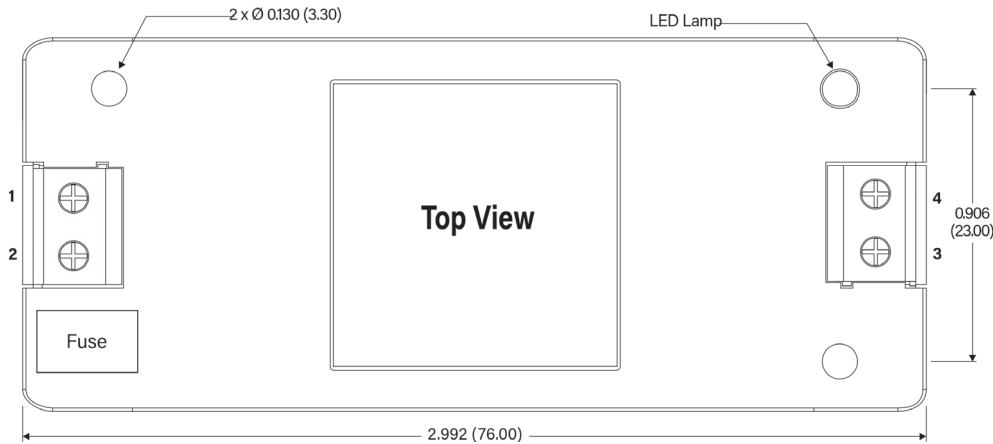
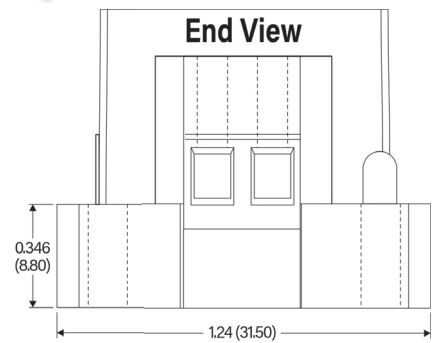
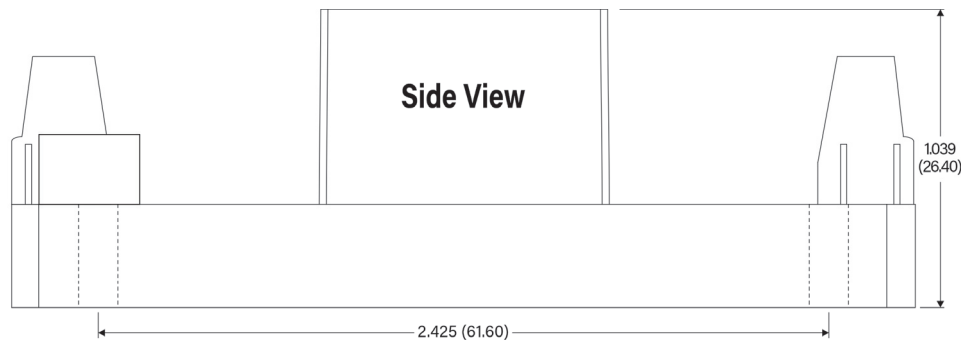
Pin Connections

Pin	Function
1	AC-Neutral
2	AC-Line
4	-Vout
5	+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 0.043 (Ø1.10)
- Weight (Typ) = 0.65 Oz (18.5g) 15 & 24 Vout Models
Weight (Typ) = 0.63 Oz (18.0g) All Other Models

Mechanical Dimensions: A2S Chassis Mount Adapter



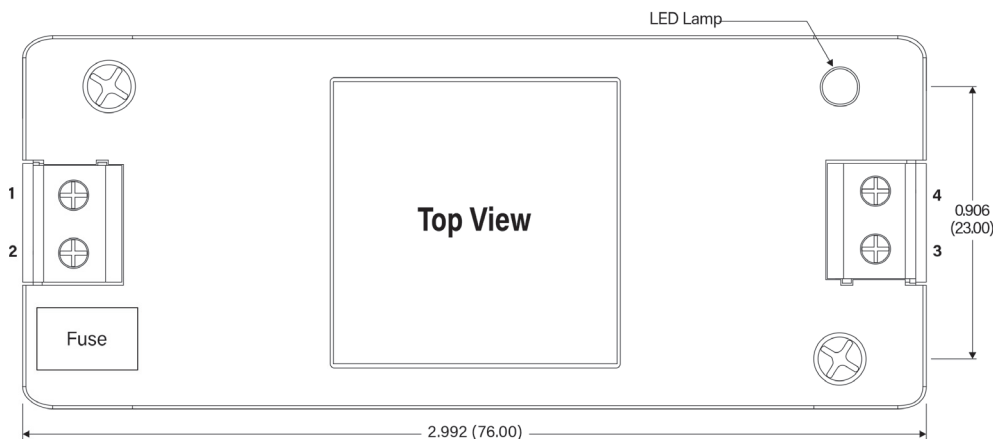
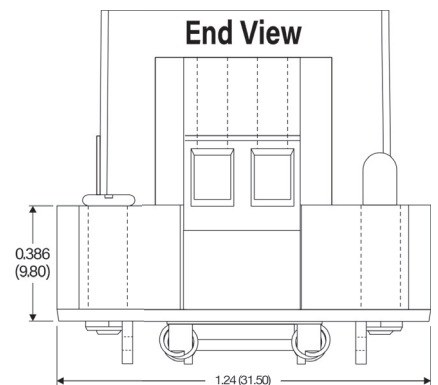
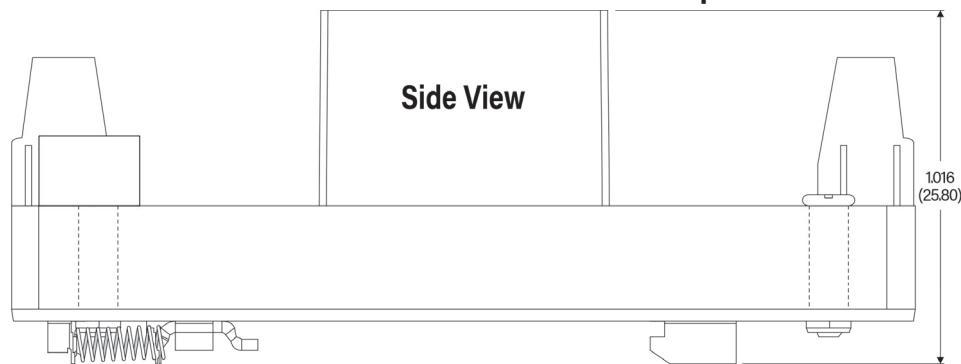
Pin Connections

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

Notes:

- All dimensions are typical in inches (mm)
- General Tolerance = ± 0.039 (± 1.00)
- Weight (Typ) = 1.34 Oz (38g)
- Wire Range: 24 - 12 AWG
- Tightening Torque: Max 0.4 N-m

Mechanical Dimensions: A4S DIN Rail Mount Adapter



Pin Connections

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

Notes:

- All dimensions are typical in inches (mm)
- General Tolerance = ± 0.039 (± 1.00)
- Weight (Typ) = 2.04 Oz (58g)
- Wire Range: 24 - 12 AWG
- Tightening Torque: Max 0.4 N-m
- Mounting Rail: TS 35 Rail must be connected to safety ground



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