

MPM-20SVLD Series

Compact, Ultra Wide Input 20W, High Performance AC/DC Power Supplies

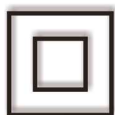


Key Features:

- 20W Output Power
- EN 62368 Approved (UL)
- Meets EN 60601 (2xMOPP)
- Universal 85-305 VAC Input
- 4,000 VAC I/O Isolation
- Reinforced Insulation
- Meets EN 55032 Class B
- Meets EN 55014
- Chassis Mount Available
- DIN Rail Mount Available
- Low Cost



RoHS



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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.

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range		85		305	VAC
		100		430	VDC
Input Frequency		47		440	Hz
Input Current	See Model Selection Guide				
Leakage Current	277VAC/50 Hz			0.10	mA
Inrush Current	115 VAC		20.0		A Pk
	230 VAC		45.0		

Parameter	Conditions	Min.	Typ.	Max.	Units
Minimum Load	See Note 1	0			%
Output Voltage Accuracy			±1.5		%
Line Regulation	See Note 2		±0.5		%
Load Regulation	I _{OUT} = 0% to 100%		±1.0		%
Ripple & Noise (20 MHz)	See Note 3		100	150	mV Pk - Pk
Standby Power Consumption, 230 VAC	24 V _{OUT}		0.12		W
	All Other Models		0.10		
Hold-Up Time	115 VAC		8		mSec
	230 VAC		50		
Temperature Coefficient			±0.02		%/°C
Overload Protection	Autorecovery		110		%I _{OUT}
Short Circuit Protection, See Note 4	Continuous (Autorecovery)				

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, See Note 5	Input to Output	4,000			VAC
Isolation Resistance	500 VDC	100			MΩ
Switching Frequency			65		kHz

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

Parameter	Conditions	Min.	Typ.	Max.	Units
Case Size		See Mechanical Diagrams (Page 5, 6)			
Case Material		Non-Conductive Black Plastic (UL94-V0)			
Weight		See Mechanical Diagrams (Page 5, 6)			

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1,50			MHours
Safety Standards	UL/cUL 62368-1 recognition (UL certificate)				
	Meets EN 60335, EN 61558, EN 60601				
Design Life, 230 VAC	25 °C, 100% Load			>130 x 10 ³ h	
	55 °C, 80% 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 (μ F, Max)	Efficiency (230 VAC, %, Typ)	Fuse Rating Slow-Blow (See Note 7)
	Current (A Max)		Voltage (VDC)	Current (mA Max)	Power (W)				
	115 VAC	230 VAC							
MPM-20SV-03LD	0.50	0.30	3.3	4,500	14,85	7.50	8,000	81	3.15A/300V
MPM-20SV-05LD	0.50	0.30	5.0	4,000	20.0	7.50	8,000	85	3.15A/300V
MPM-20SV-09LD	0.50	0.30	9.0	2,200	20.0	15.0	5,400	85	3.15A/300V
MPM-20SV-12LD	0.50	0.30	12.0	1,670	20.0	20.0	4,000	86	3.15A/300V
MPM-20SV-15LD	0.50	0.30	15.0	1,330	20.0	20.0	3,000	87	3.15A/300V
MPM-20SV-24LD	0.50	0.30	24.0	830	20.0	30.0	1,000	87	3.15A/300V

Notes:

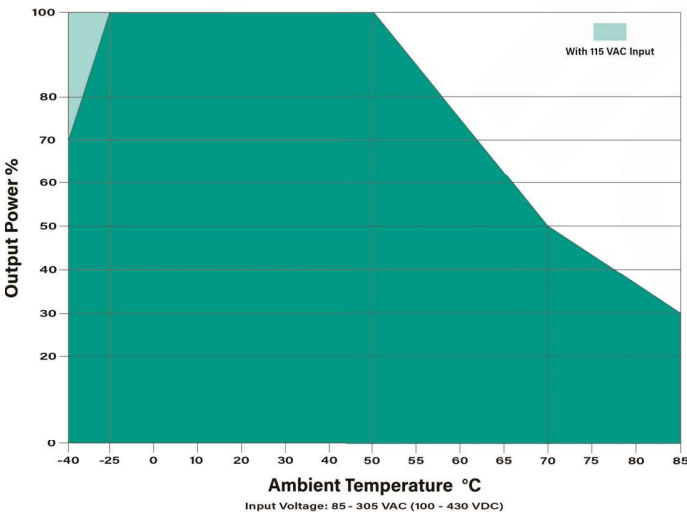
1. Operation at no load will not damage the units, however, they may not meet all specifications.
2. Line regulation is measured with the unit at full load while the input is varied from 85 VAC to 305 VAC.
3. When measuring output ripple, it is recommended that an external 0.1 μ F high frequency ceramic capacitor be placed in parallel with a 47 μ F high frequency electrolytic capacitor from the +Vout pin to the -Vout 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. A 3.15A/300 VAC fuse is built into the unit. This is sufficient if the application environment will see voltage surges of ≤ 1 kV. If surges higher than this are possible, an external 3.15/300A fuse is recommended. See the application circuit on page 5.

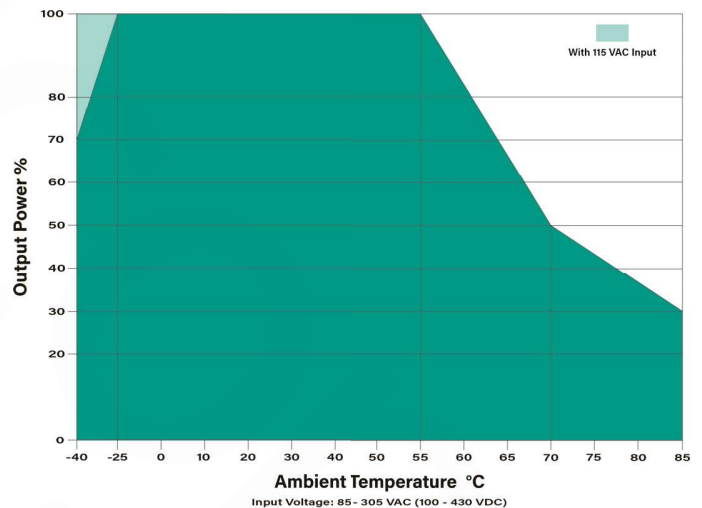
For the A2S adapter board option, add the suffix "-A2S" to the model number (i.e. MPM-20SV-15LD-A2S) See Page 6

For the A4S adapter board option, add the suffix "-A4S" to the model number (i.e. MPM-20SV-24LD-A4S) See Page 6

Temperature Derating: 3.3/5/9 VOUT



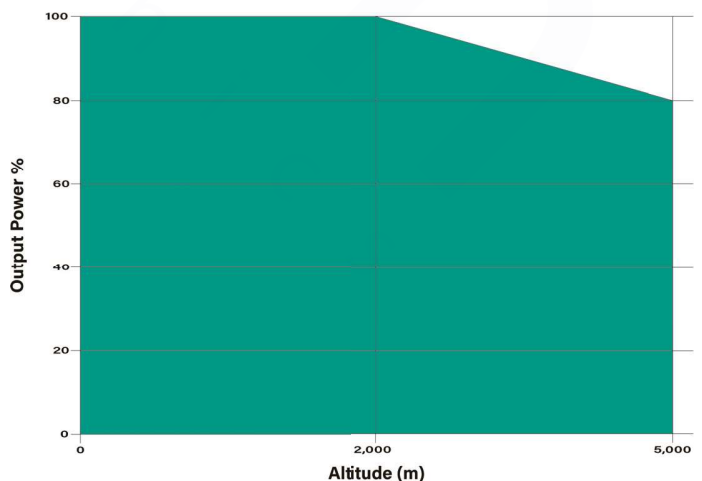
Temperature Derating: 12/15/24 VOUT



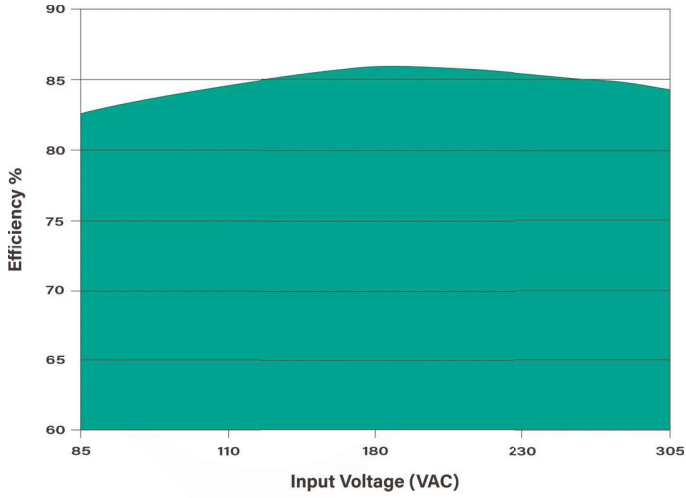
Input Voltage Derating



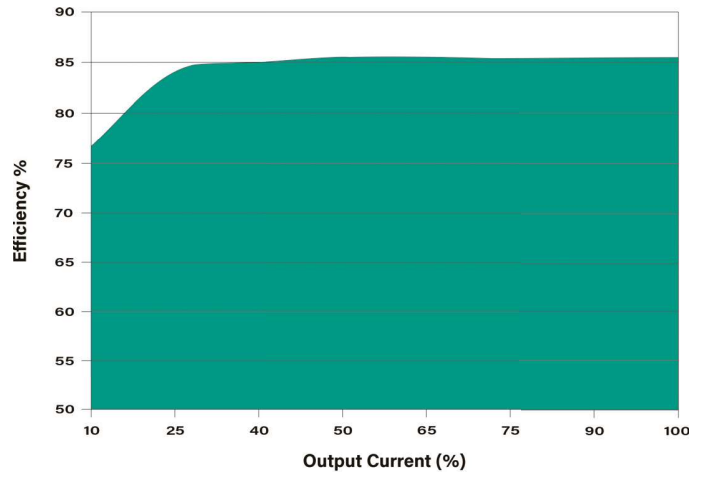
Altitude Derating



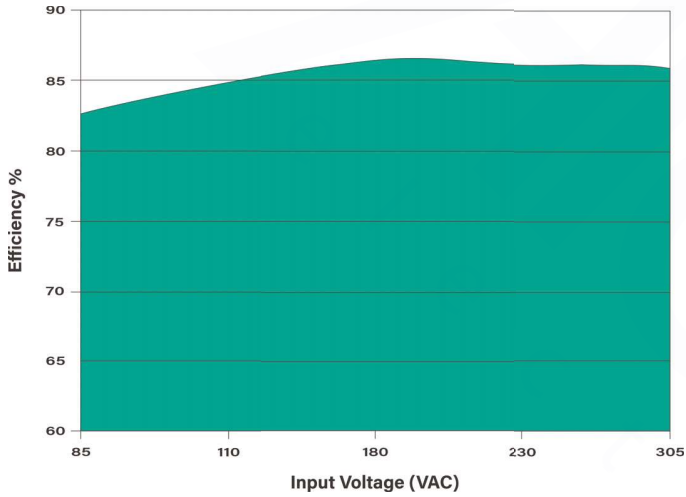
Efficiency vs Input Voltage: 5 V_{OUT} Models



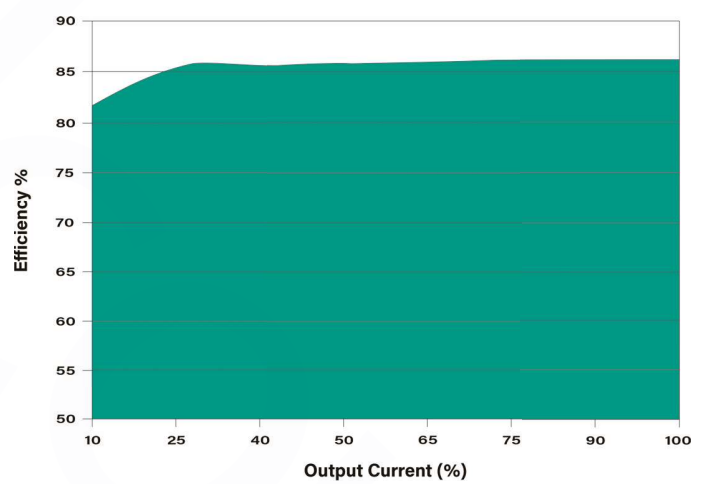
Efficiency vs Output Load: 5 V_{OUT} Models



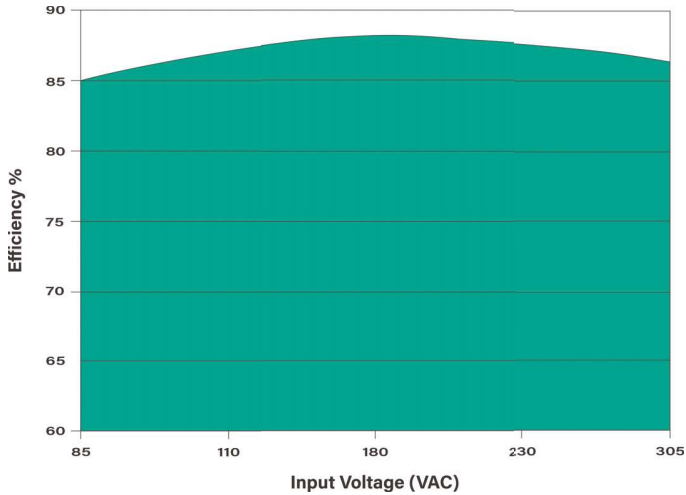
Efficiency vs Input Voltage: 12 V_{OUT} Models



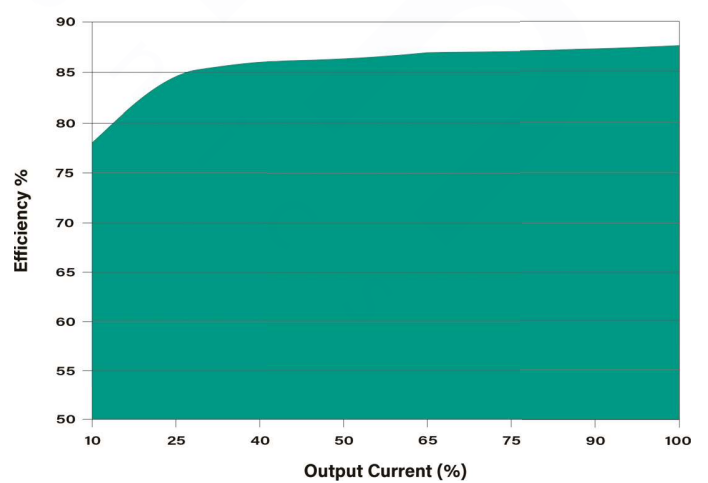
Efficiency vs Output Load: 12 V_{OUT} Models



Efficiency vs Input Voltage: 24 V_{OUT} Models



Efficiency vs Output Load: 24 V_{OUT} 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
Surge, See Note 4 At Right	EN 61000-4-5	B	±2 kV Line to Line
CS	EN 61000-4-6	A	10V rms
Voltage Dips, Short, Interruptions	EN 61000-4-11	B	0% - 70%

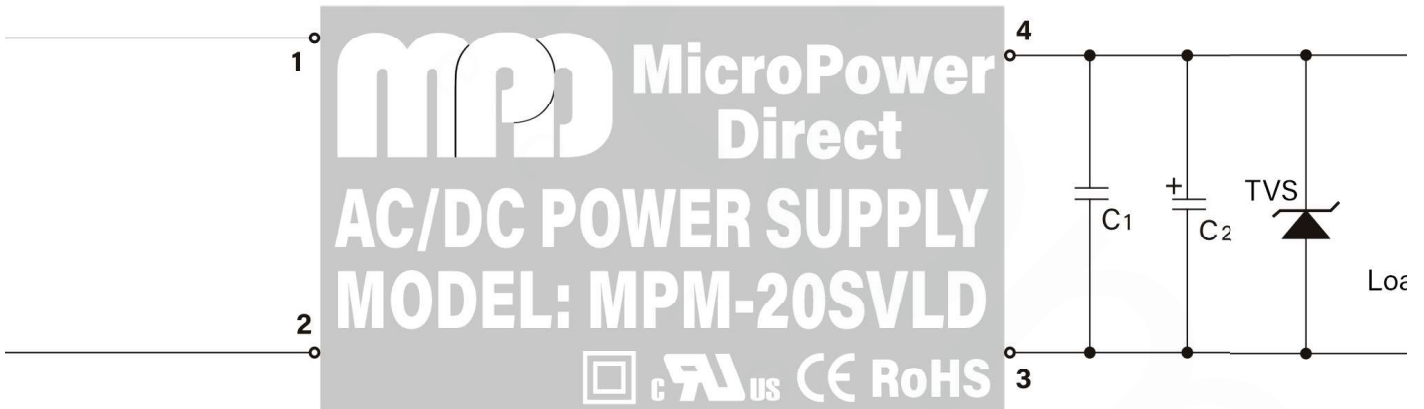
Notes:

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



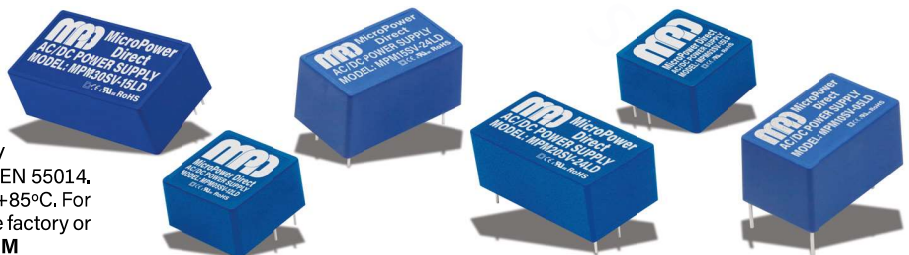
The diagram above illustrates a typical application connection of the MPM-20SVLD series. Notes on this circuit (starting with the input circuit) are:

1. The unit includes an internal 3,15/300 VAC slow blow fuse. If the application requires more, see the EMI Connection on page 5.
2. All units are rated for EN 55032 (CE/RE) class B without external components.
3. 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.
4. The TVS is added to protect circuits being powered from damage if the module fails.

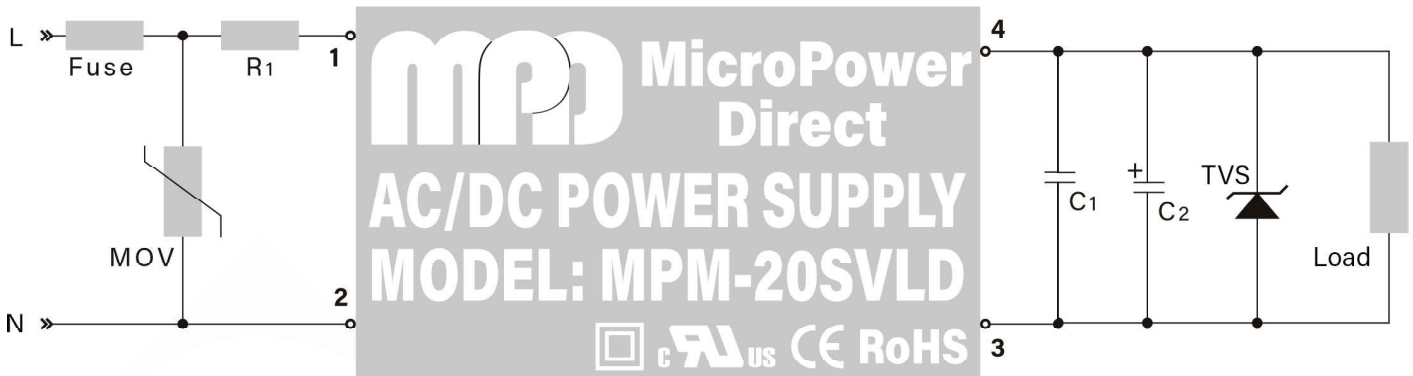
Model	C1	C2	TVS
MPM-20SV-03LD	1.0 μF/50V	10 μF/16V	SMBJ7.0A
MPM-20SV-05LD		10 μF/16V	SMBJ7.0A
MPM-20SV-09LD		10 μF/25V	SMBJ12A
MPM-20SV-12LD		10 μF/25V	SMBJ20A
MPM-20SV-15LD		10 μF/25V	SMBJ20A
MPM-20SV-24LD		10 μF/35V	SMBJ30A

Compact 3W-30W AC/DC's

MPD's new MPM-xxSVLD AC power supplies offer small size & high performance over a power range of 3W to 30W. Common features include high efficiency, EN 62368 safety approval, reinforced insulation (Class II), wide universal 85 - 305 VAC input, and 4 kV I/O isolation. All models meet EN 55032, class B and EN 55014. Operation is specified for the wide range of -40°C to +85°C. For pricing or full technical information please contact the factory or visit our website: WWW.MICROPOWERDIRECT.COM



EMI Connection



The diagram above illustrates an EMI connection of the **MPM-20SVLD** series. The input components are required to meet the more stringent EFT/Surge levels of EN 61000-4 (see notes for EMI Characteristics table on page 4). Some notes on these components are:

1. To meet the higher input surge requirement, it's recommended that an external fuse be used. The suggested fuse size is a 3.15A/300 VAC slow blow (In the event of an input spike this fuse should blow before the internal fuse).
2. All units are rated for EN 61000-4-4 (± 2 kV). With the addition of the MOV and R1 shown in the EMI connection above, they will meet EN 61000-4-4 (± 4 kV). Component values are given in the table at right.
3. All units are rated for EN 61000-4-5 (± 1 kV LL). With the addition of the MOV and R1 shown in the EMI connection above, they will meet EN 61000-4-5 (± 2 kV LL). All component values are given in the table at right.

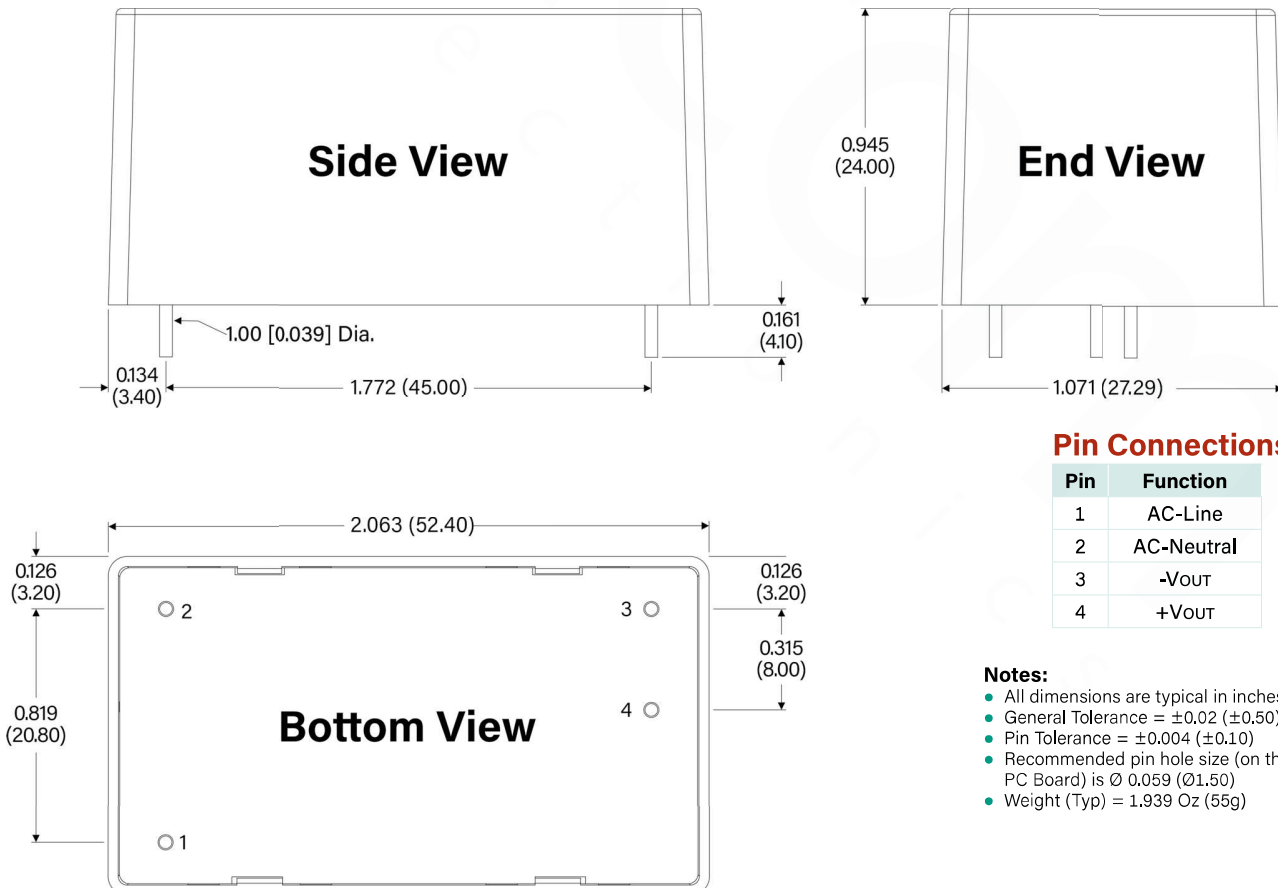
4. The output filtering capacitors (C1 & C2) and TVS are discussed in the notes for the typical connection diagram on page 4.

5. Suggested component values are:

Component	3.3 Vout	5.0 Vout	9.0 Vout	12 Vout	15 Vout	24 Vout
Fuse	3.15A/300 VAC Slow Blow					
MOV	S14K350					
R1	3 Ω /3W					
C1	1 μ F/50V					
C2	10 μ F/16V	10 μ F/16V	10 μ F/25V	10 μ F/25V	10 μ F/25V	10 μ F/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

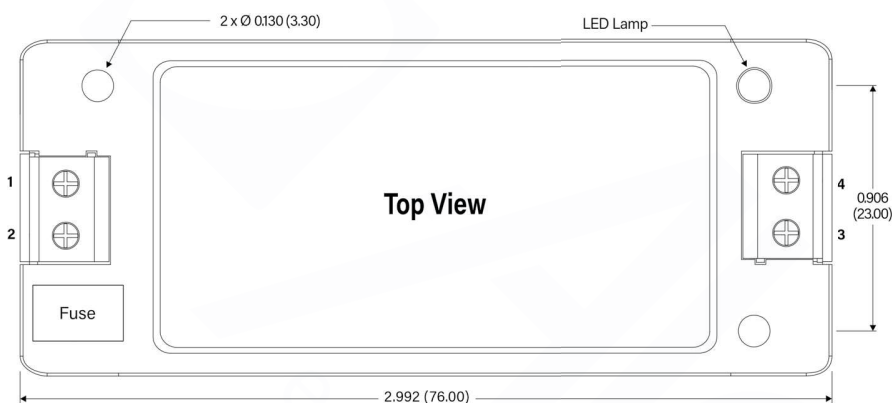
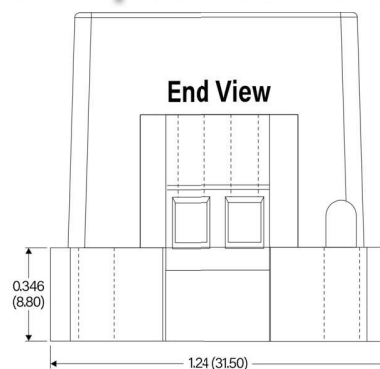
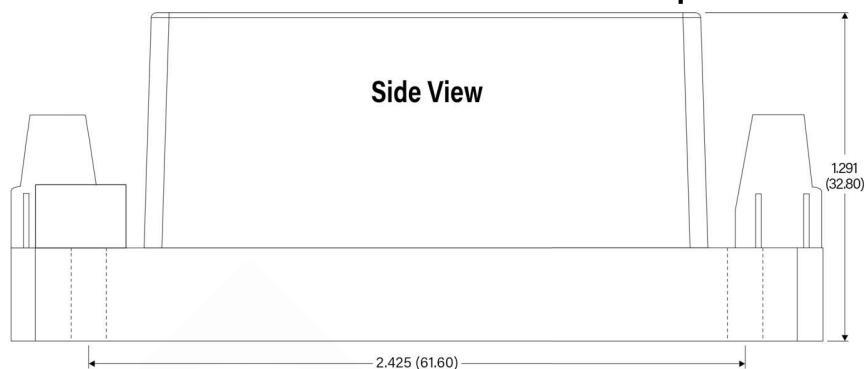
Pin	Function
1	AC-Line
2	AC-Neutral
3	-Vout
4	+Vout

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 $\varnothing 0.059$ ($\varnothing 1.50$)
- Weight (Typ) = 1.939 Oz (55g)

Mechanical Dimensions: A2S Chassis Mount Adapter

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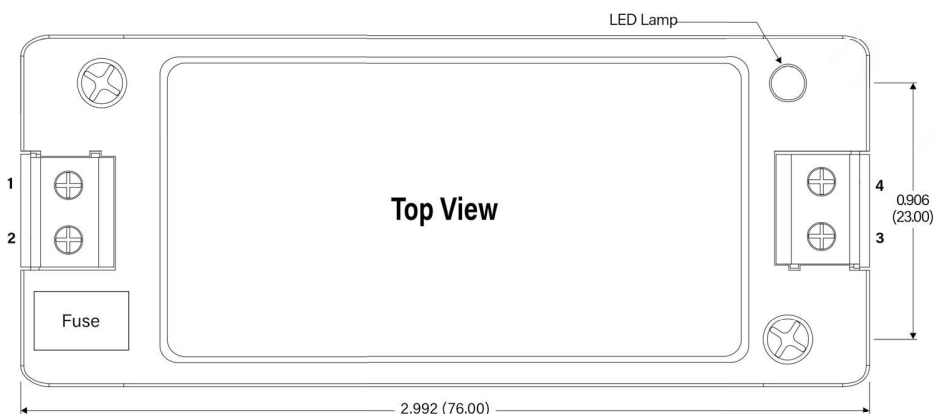
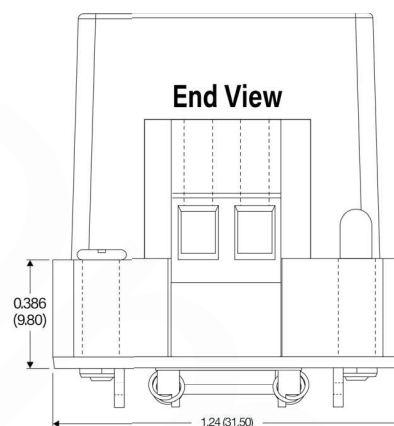
Pin Connections

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) = 2.645 Oz (75g)
- 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) = 3.35 Oz (95g)
- 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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