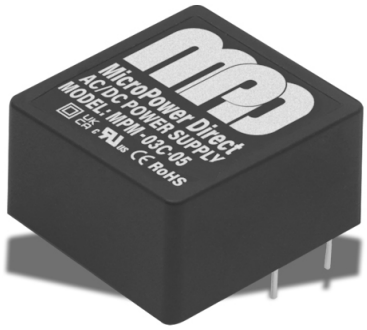
MPM-03C

3W, Compact, High Isolation AC/DC Power Supplies



Key Features:

- 3W Output Power
- 85-305 VAC Input
- 4,000 VAC Isolation
- Compact Size
- Efficiency to 78%
- -40°C to +85°C Temp
- Meets EN 55032 B
- >2,800 kHour MBTF
- UL Approval

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	AC Input	85		305	VAC
	DC Input	100		430	VDC
Input Frequency		47		63	Hz
Input Current	115 VAC			0.08	A
	230 VAC			0.06	
Inrush Current (Cold Start)	115 VAC		15		A
	230 VAC		25		
Leakage Current	277 VAC / 50Hz			0.25	mA RMS
Recommended External Input Fuse	Select based on application		1A, Slow-Blow, Required		

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy	3.3V Output		±3		%
	Others		±2		
Line Regulation	Full Load		±0.5		%
Load Regulation	0 to 100% Load		±1		%
Ripple & Noise (20 MHz) - See Note 1			50	100	mV P - P
Standby Power Consumption	230 VAC		0.1		W
Hold-Up Time	115 VAC		5		ms
	230 VAC		50		
Temperature Coefficient			±0.02		%/°C
Over Voltage Protection	3.3/5VDC output		7.5		VDC
	9VDC output		15		
	12VDC output		16		
	15VDC output		20		
	24VDC output		30		
Over Load Protection	Self-Recovery	200			%Io
Short Circuit Protection	Hiccup Mode (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	See Note 5	4,000			VAC

EMI Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions, See Page 4	CISPR32/EN 55032		Class B
Conducted Emissions	CISPR32/EN 55032		Class B

Environmental

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

Physical

Case Size	See Mechanical Drawing (Page 5 & 6)
Case Material	Flame Retardent, Non-Conductive, Black Plastic (UL94-V0)
Weight	See Mechanical Drawing (Page 5 & 6)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2.799			MHours
Safety Standards	UL/cUL 62368-1 Recognition (UL Certificate)				
Lead Temperature	Wave, 5 - 10s			260	°C
	Manual, 3 - 5s			360	

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MICROPOWER DIRECT

Model Number	Input		Output			Output Capacitive Load (μF Max)	Efficiency (%, Typ)
	Current (mA)		Voltage (VDC)	Current (mA, Max)	Power (W)		
	115 VAC	230 VAC					
MPM-03C-03	80	60	3.3	900	3W	4000	71
MPM-03C-05	80	60	5	600	3W	3000	75
MPM-03C-09	80	60	9	333	3W	1200	77
MPM-03C-12	80	60	12	250	3W	1200	77
MPM-03C-15	80	60	15	200	3W	680	78
MPM-03C-24	80	60	24	125	3W	220	78

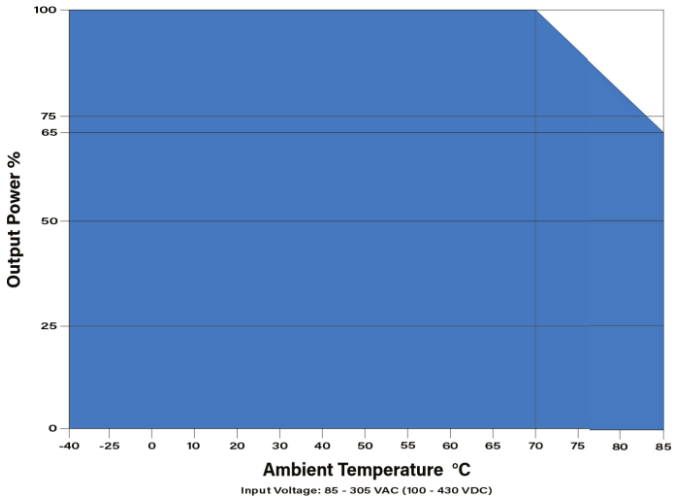
Notes:

1. The “tip and barrel method” is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor.
2. Unless otherwise specified, EMC performance indicators are tested according to typical connection circuit on page 4.
3. When the output terminal of the product needs to be connected to PE through a Y capacitor, or close to the metal frame, please refer to "EMI Connection for Class I Equipment."
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 ºC. For manual soldering it is specified for 3 to 5 seconds with a tolerance of ±10 ºC.
7. For the **MPM-03C** series, an external input fuse is required. A 1A/300 VAC slow blow is recommended, however, the actual application environment may require a different value. See the application notes on pages 4 and 5 for suggested sizes.

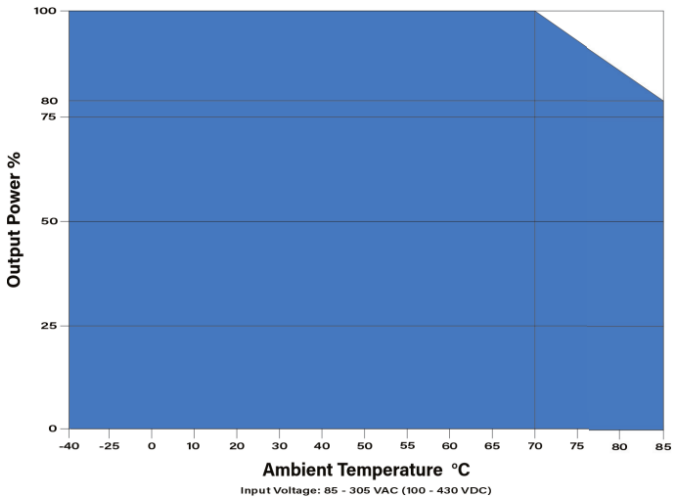
For the A2S adapter board option, add the sufix "-A2S" to the model number (i.e. **MPM-03C-03-A2S**). See Page 6.

For the A4S adapter board option, add the sufix "-A4S" to the model number (i.e. **MPM-03C-03-A4S**). See Page 6.

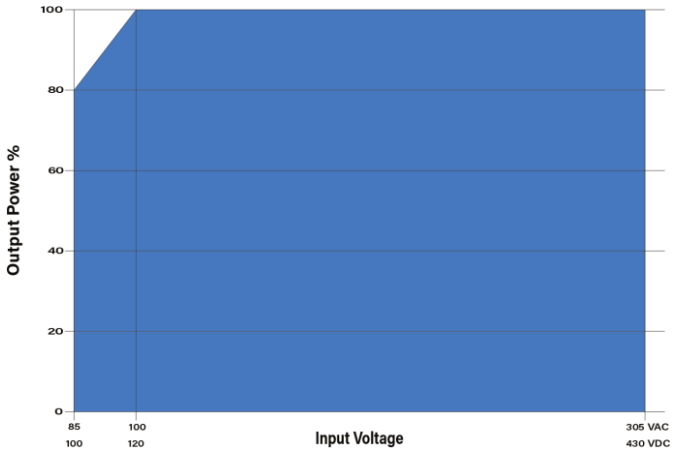
Temperature Derating: 3.3 VOUT



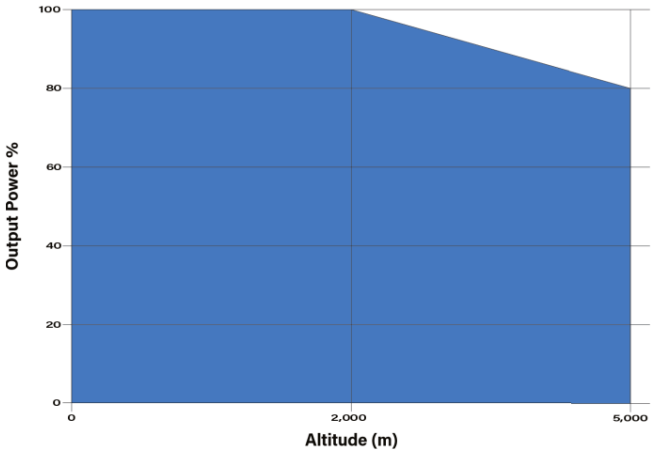
Temperature Derating: All Other Outputs



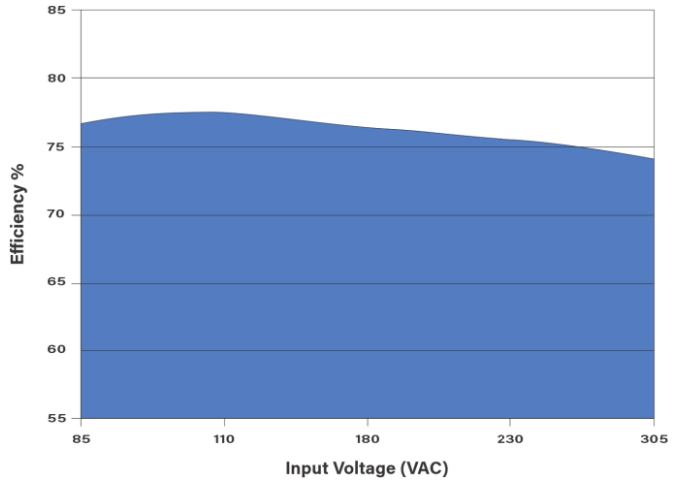
Input Voltage Derating



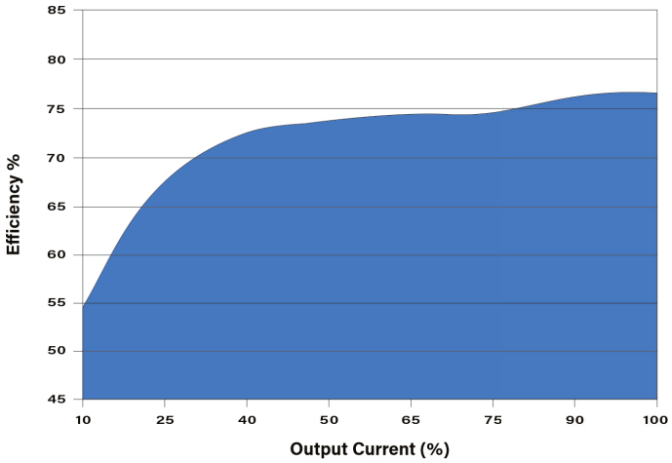
Altitude Derating



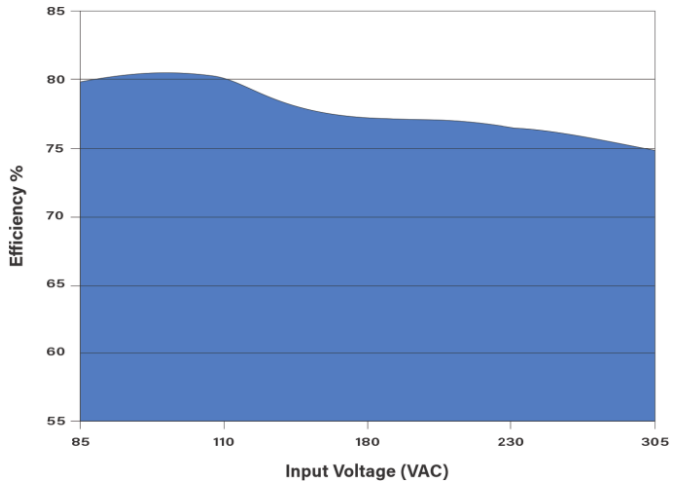
Efficiency vs Input Voltage: 5 VOUT Models



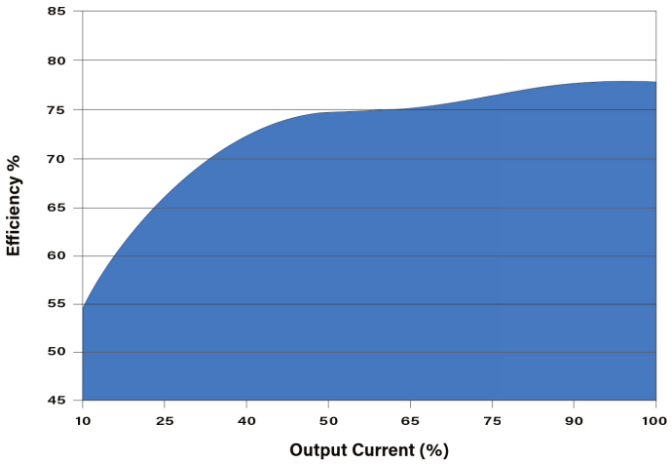
Efficiency vs Output Load: 5 VOUT Models



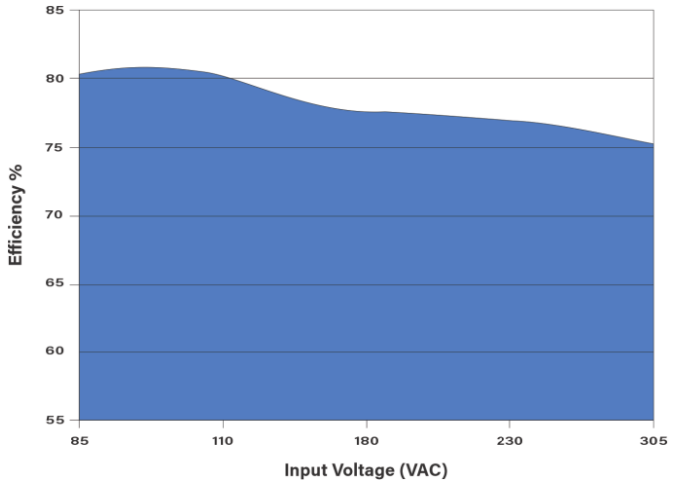
Efficiency vs Input Voltage: 12 VOUT Models



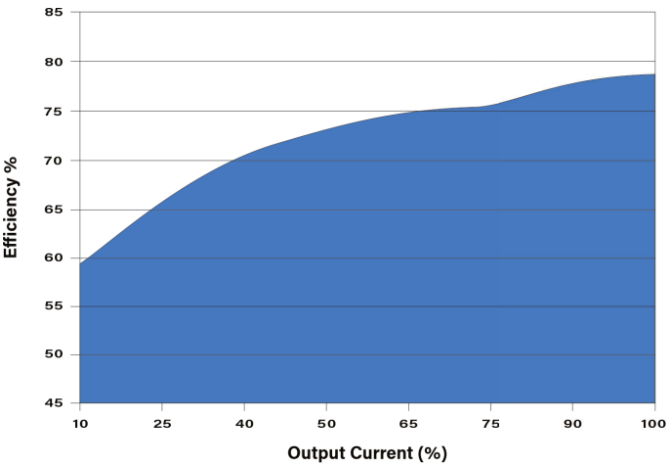
Efficiency vs Output Load: 12 VOUT Models



Efficiency vs Input Voltage: 24 VOUT Models



Efficiency vs Output Load: 24 VOUT Models



EMI Characteristics

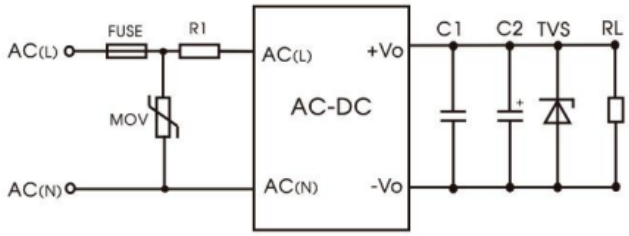
Parameter	Standard	Criteria	Level
Radiated Emissions (RE)	CISPR32/EN55032		B
	EN55014-1		
Conducted Emissions (CE)	CISPR32/EN55032		B
	EN55014-1		
ESD	IEC/EN61000-4-2	B	Contact ±6KV/Air ±8KV
	EN55014-2	B	
RS	IEC/EN61000-4-3	A	10V/m
	EN55014-2	A	
EFT	IEC/EN61000-4-4	B	±2KV
	IEC/EN61000-4-4	B	±4KV
	IEC/EN61000-4-4	A	±4KV
	IEC/55014-2	B	
Surge	IEC/EN61000-4-5	B	line to line ±1KV
	IEC/EN61000-4-5	B	line to line ±2KV
	IEC/EN61000-4-5	A	line to line ±2KV/line to PE ±4KV
	EN55014-2	B	
CS	IEC/EN61000-4-6	A	10 Vr.m.s
	IEC/EN55014-2	A	
Voltage dips, Shorts, Interruptions	IEC/EN61000-4-11	B	0%, 70%
	EN55014-2	B	

Notes:

1. To meet the rquirements of CISPR32/EN55032 Class B, for Class II equipment, use the "Typical Connection" or the "EMI Connection for Class II Equipment" as shown below. Contact the factory for more information.
2. To meet the requirements of IEC/EN61000-4-4 (±2 kV, Criteria B), use the "Typical Connection" as shown below. To meet EN61000-4-4 (±4 kV, Criteria B) use the "EMI Connection for Class II Equipment" as shown below.
3. To meet the requirements of IEC/EN 61000-4-4 (±4 kV, Criteria A), use the "EMI Connection for Class I Equipment" as shown at the top of page 5. Contact the factory for more information.
4. To meet the requirements of IEC/EN 61000-4-5 (±2 kV line to line, Criteria B), use the "Typical Connection" as shown below. Contact the factory for more information.
5. To meet the requirements of IEC/EN 61000-4-5 (±2 kV line to line, Criteria B), use the "EMI Connection for Class II Equipment" as shwon below. Contact the factory for more information.
6. To meet the requirements of IEC/EN 61000-4-5 (±2 kV line to line / ±4 kV line to ground, Crtieria A), use the "EMI Connection for Class I Equipment" as shown at the top of page 5.
7. To meet the requirements of CISPR32/EN55032 Class B, for Class I equipment, use the "EMI Connection for Class I Equipment" as shown at the top of page 5. Contact the factory for more information.

Application Circuits

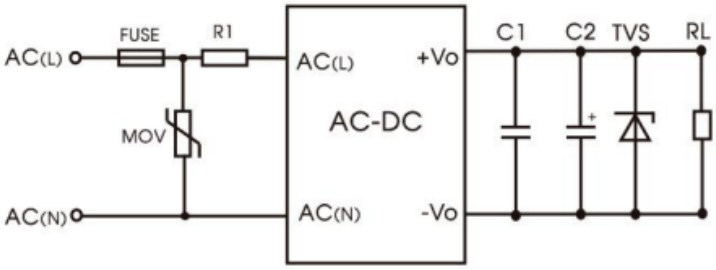
Typical Connection Diagram



Part No.	C1 (uF)	C2 (uF)	Fuse	R1	TVS	MOV
MPM-03C-03	1	150	1A/ 300V, slow-blow, req.	12 Ω/ 3W, wire-wound resistor, req.	SMBJ7.0A	S10K350
MPM-03C-05		150			SMBJ7.0A	
MPM-03C-09		120			SMBJ12A	
MPM-03C-12		120			SMBJ20A	
MPM-03C-15		120			SMBJ20A	
MPM-03C-24		68			SMBJ30A	

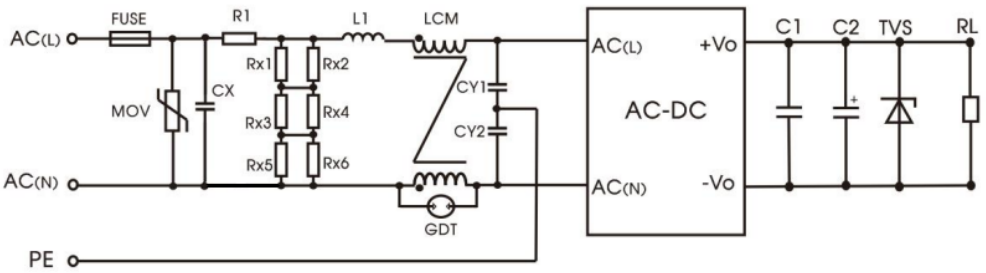
Output Filter Components:
We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2. Choose a capacitor voltage rating with at least 20% margin. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

EMI Connection for Class II Equipment



Component	Recommended Value
FUSE	2A/300V, slow-blow, required
MOV	S14K350
R1	33Ω/3W (wire-round resistor)

EMI Connection for Class I Equipment

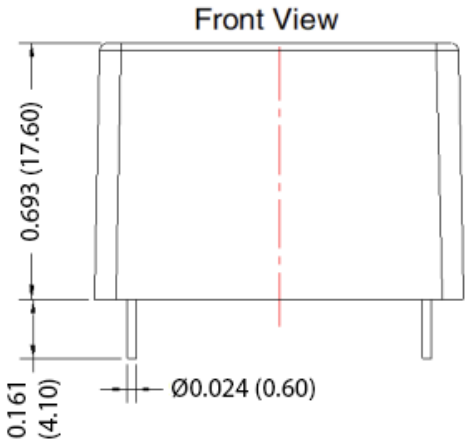


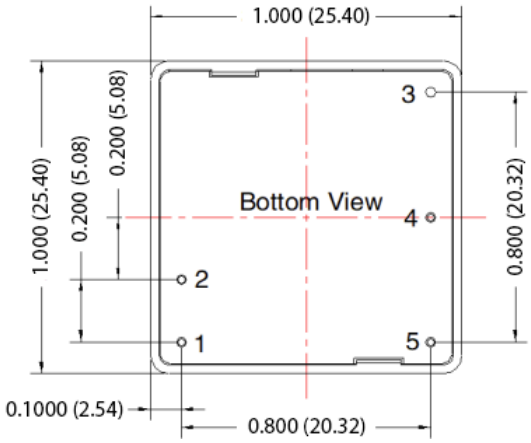
(Recommended when the output terminal of the product needs to be connected to PE or connected to PE through a Y capacitor)

Component	Recommended Value
FUSE	2A/300V, slow-blow, required
MOV	S14K350
CX	334K/305VAC
R1	3Ω/3W (wire-round resistor)
L1	1.2mH/0.3A
CY1/CY2	1nF/400VAC
GDT	300V/1KA
LCM	20 mH

Note: Rx1/Rx2/Rx3/Rx4/Rx5/Rx6 is the bleeder resistance of CX, and the recommended resistance value is 1.5MΩ/150VDC.

Mechanical Diagrams





THIRD ANGLE PROJECTION

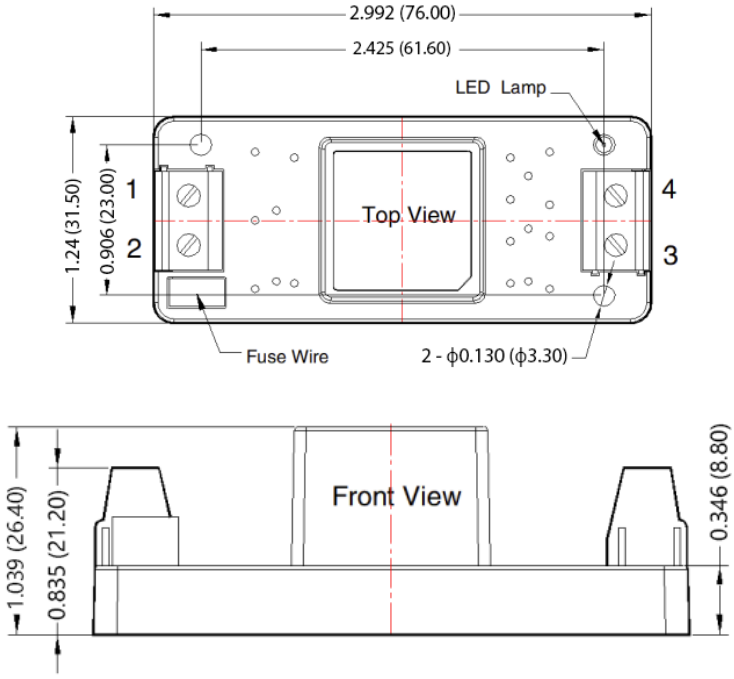
Note: Grid 0.1 * 0.1 in

Notes:
- All dimensions are typical in inches (mm)
- Pin diameter tolerances: ±0.004 (±0.10)
- General tolerances: ±0.020 (±0.50)

Weight:
- Standard DIP Package: 0.62 oz (17.5g)

Pin-Out	
Pin	**Function**
1	AC(N)
2	AC(L)
3	No Pin
4	-Vo
5	+Vo

A2S Chassis Mechanical Diagram



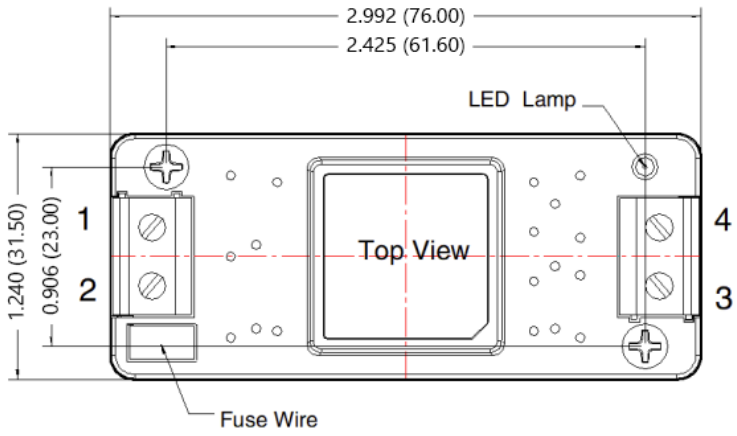
THIRD ANGLE PROJECTION

Pin-Out	
Pin	**Function**
1	AC(N)
2	AC(L)
3	-Vo
4	+Vo

Notes:
- All dimensions are typical in inches (mm)
- Wire range: 24-12 AWG
- Tightening torque: Max 0.4 N·m
- General tolerances: ±0.039 (±1.00)

Weight:
- A2S Chassis: 1.34 oz (38.0g)

A4S Din-Rail Mechanical Diagram

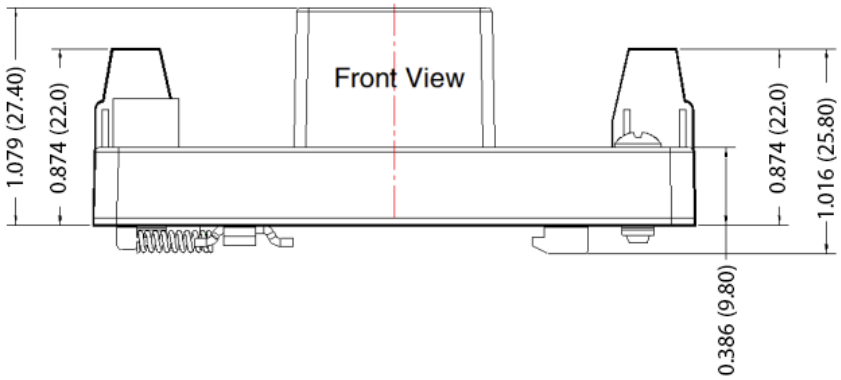


THIRD ANGLE PROJECTION

Pin-Out	
Pin	**Function**
1	AC(N)
2	AC(L)
3	-Vo
4	+Vo

Notes:
- All dimensions are typical in inches (mm)
- Wire range: 24-12 AWG
- Tightening torque: Max 0.4 N·m
- General tolerances: ±0.039 (±1.00)

Weight:
- A4S Din-Rail: 2.05 oz (58.0g)



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