MPM-30C

30W, Compact, High Isolation AC/DC Power Supplies

Key Features:

- 30W Output Power
- 85-305 VAC Input
- 4,200 VAC Isolation
- Compact Size
- Efficiency to 90%
- -40°C to +85°C Temp
- Meets EN 55032 B
- >500 kHour MBTF
- Reinforced Insulation
- 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	3.3/5/9/12/15/24V	100		430	VDC
		48V	120		430	
Input Frequency			47		63	Hz
Input Current		115 VAC			0.75	A
		230 VAC			0.50	
Inrush Current (Cold Start)		115 VAC		25		A
		230 VAC		50		
Leakage Current		277 VAC / 50Hz			0.1	mA
Built-In fuse				2A/300V, slow blow		

Output

Parameter	Conditions		Min.	Typ.	Max.	Units
Output Voltage Accuracy	See Tolerance	3.3V		±3		%
		Others		±2		
Line Regulation		Full Load		±0.5	±1	%
Load Regulation	0 to 100% Load	3.3V		±2		%
		5V		±1.5		
		12/15/24/48V		±1		
Ripple & Noise (20 MHz), See Note 1		3.3/5/9/12/15V			100	mV P - P
		24/48V		100	150	
Standby Power Consumption	230VAC	3.3/5/9/12/15V		0.1	0.12	W
		24/48V		0.15	0.2	
Hold-Up Time		115 VAC		10		ms
		230 VAC		50		
Temperature Coefficient				±0.02		%/°C
Over Voltage Protection	3.3V Output				6.3	VDC
	5, 9, 12V Output				16	
	15V Output				25	
	24V Output				35	
	48V Output				60	
Over Load Protection			110			%Io
Short Circuit Protection	Hiccup Mode (Autorecovery)					

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, See Note 5		4,200			VAC
Isolation Resistance	500VDC	100			MΩ
Switching Frequency			65		KHz

EMI Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions, See Page 3	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	2.74 x 1.54 x 0.94 in (See Mechanical Drawing on Page 5 & 6)
Case Material	Flame Retardant, Non-Conductive, Black Plastic (UL94V-0)
Weight	3.53 oz (100g) (See Mechanical Drawing on Page 5 & 6)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	0.5			MHours
Safety Standards	UL/cUL 62368-1 Recognition (UL Certificate)				
Safety Class	Class II				
Lead Temperature	Wave, 5 - 10s			260	°C
	Manual, 3 - 5s			360	

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Easton, MA 02375
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MICROPOWER DIRECT

Model Selection Guide

Model Number	Input Current (mA)		Output Voltage (VDC)	Output Current (mA, Max)	Output Power (W)	Output Capacitive Load (μF Max)	Efficiency (%, Typ)
	115 VAC	230 VAC					
MPM-30C-03	750	500	3.3	6000	19.8	6600	85
MPM-30C-05	750	500	5	7000	30	6600	86
MPM-30C-09	750	500	9	3400	30.6	4400	88
MPM-30C-12	750	500	12	2500	30	4400	90
MPM-30C-15	750	500	15	2000	30	3300	90
MPM-30C-24	750	500	24	1300	31.2	1000	88
MPM-30C-48	750	500	48	630	30.2	470	90

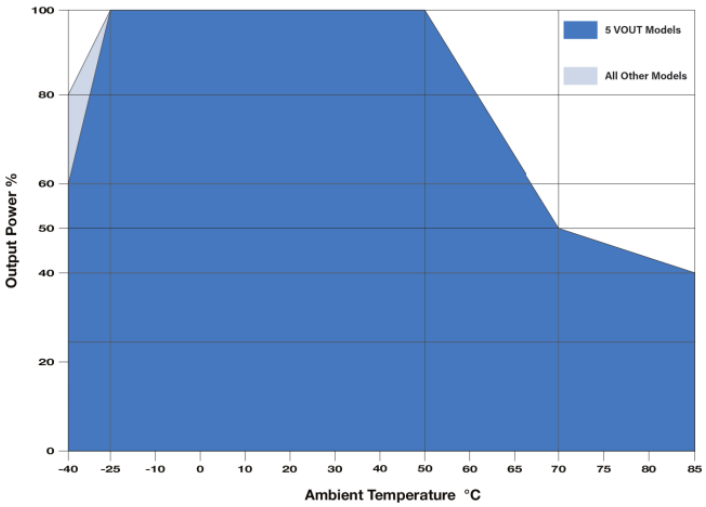
Notes:

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. The **MPM-30C** series includes a built-in fuse of 2A/300V, slow blow, however, the actual application environment may require a different value. See the application notes on page 4 for suggested sizes.

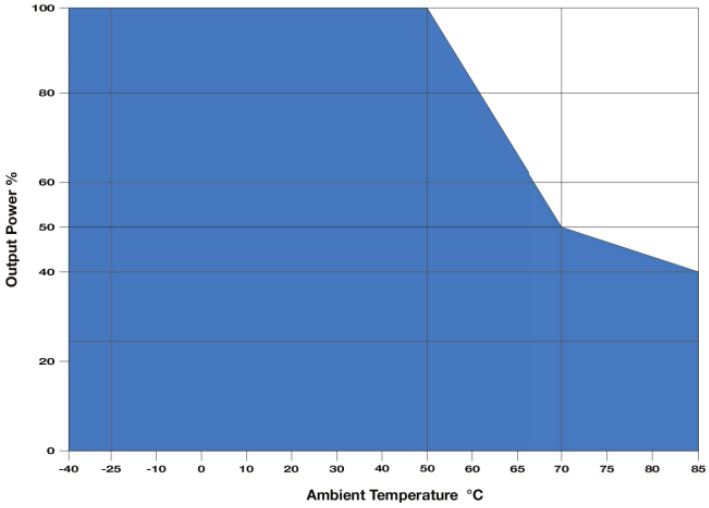
For the A2S adapter board option, add the sufix "-A2S" to the model number (i.e. **MPM-30C-03-A2S**). See Page 5.

For the A4S adapter board option, add the sufix "-A4S" to the model number (i.e. **MPM-30C-03-A4S**). See Page 5.

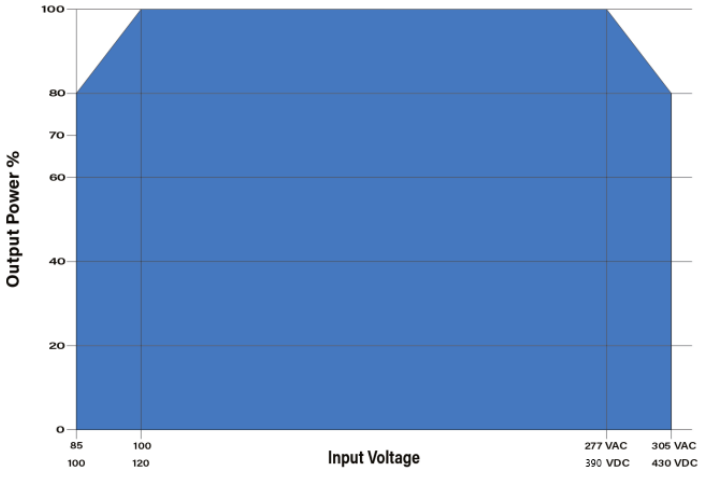
Temperature Derating: ≤115 VAC IN



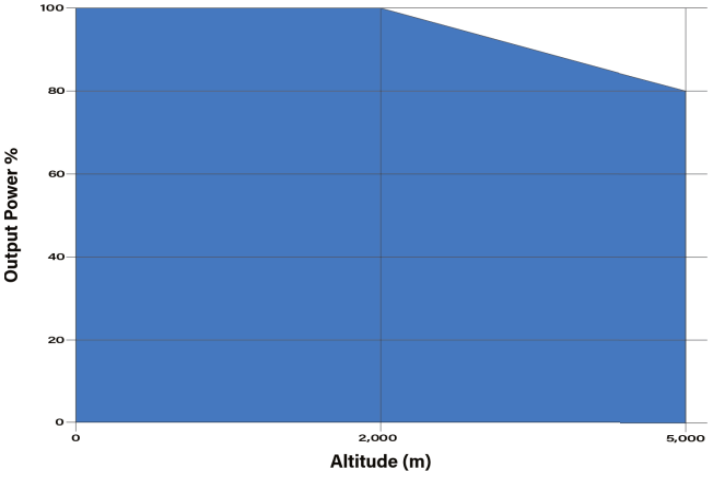
Temperature Derating: 230 VAC IN



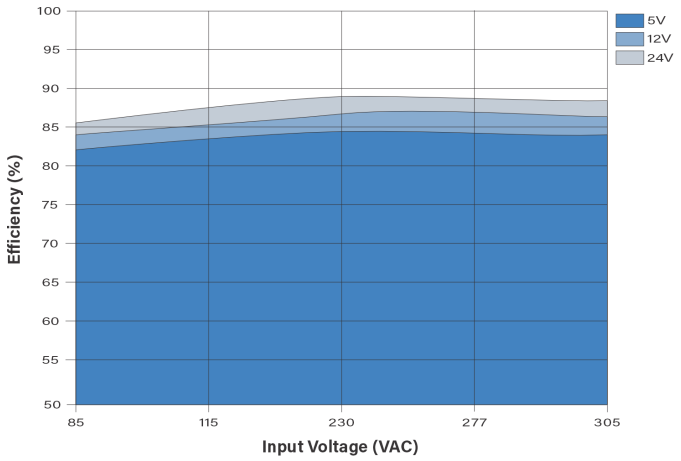
Input Voltage Derating



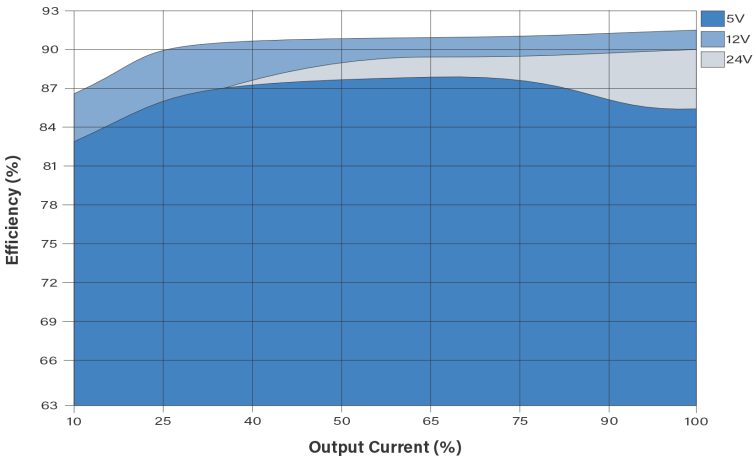
Altitude Derating



Efficiency vs Input Voltage



Efficiency vs Output Load (Vin=230VAC)



EMI Characteristics

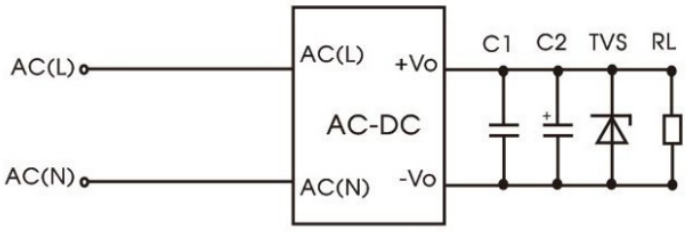
Parameter	Standard	Criteria	Level
Radiated Emissions (RE)	CISPR32/EN55032		B
	EN55014-1		
Conducted Emissions (CE)	CISPR32/EN55032		B
	EN55014-1		
ESD	IEC/EN61000-4-2	A	Contact ±8KV Air ±15KV
	EN55014-2	A	
RS	IEC/EN61000-4-3	A	10V/m
	EN55014-2	A	
EFT	IEC/EN61000-4-4	A	±2KV
	IEC/EN61000-4-4	A	±4KV
	IEC/55014-2	A	
Surge	IEC/EN61000-4-5	A	line to line ±2KV
	IEC/EN61000-4-5	A	line to line ±2KV/line to PE ±4KV
	IEC/EN55014-2	A	
CS	IEC/EN61000-4-6	A	10 Vr.m.s
	EN55014-2	A	
Voltage Dips, Short, Interruptions	IEC/EN61000-4-11	B	0%, 70%
	IEC/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 on page 4. Contact the factory for more information.
2. To meet the requirements of IEC/EN61000-4-4 (±2 kV, Criteria A), use the "Typical Connection" as shown below. To meet EN61000-4-4 (±4 kV, Criteria A) use the "EMI Connection for Class II Equipment" or "EMI Connection for Class I Equipment" as shown on page 4. Contact the factory for more information.
3. To meet the requirements of IEC/EN 61000-4-5 (±2 kV line to line, Criteria A), use the "Typical Connection" as shown on page 4. Contact the factory for more information.
4. To meet the requirements of CISPR32/EN55032 Class B, for Class I equipment, use the "EMI Connection for Class I Equipment" as shown on page 4. Contact the factory for more information.
5. To meet the requirements of IEC/EN 61000-4-5 (±2 kV line to line / ±4 kV line to ground, Critieria A), use the "EMI Connection for Class II Equipment" for "EMI Connection for Class I Equipment" as shown on page 4. Contact the factory for more information.

Application Circuits

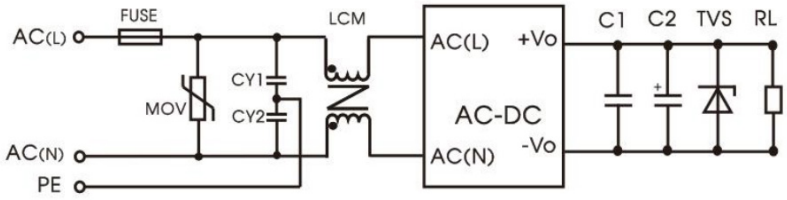
Typical Connection Diagram



Part No.	C1	C2	TVS
MPM-30C-03	1 uF/ 100V	10uF/ 50V	SMBJ7.0A
MPM-30C-05			SMBJ7.0A
MPM-30C-09			SMBJ12A
MPM-30C-12			SMBJ20A
MPM-30C-15			SMBJ20A
MPM-30C-24			SMBJ30A
MPM-30C-48		10uF/ 63V	SMBJ64A

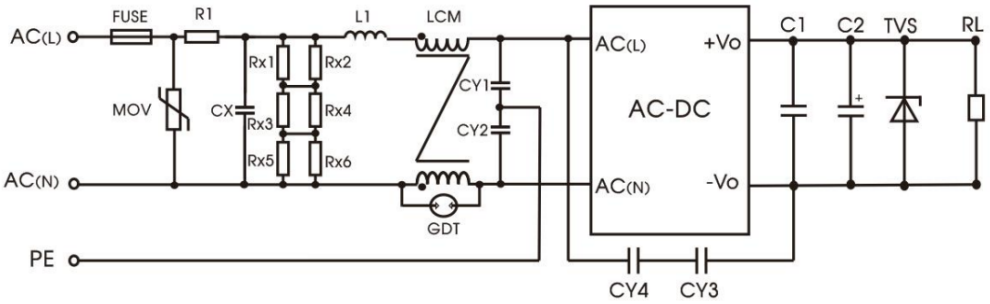
Output Filter Components:
We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2. Choose a capacitor voltage rating with at least 20% margin. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the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

EMI Connection for Class II Equipment



Component	Recommended Value
FUSE	3.15A/300V,
MOV	S14K350
CY1/CY2	1nF/400VAC
LCM	10mH

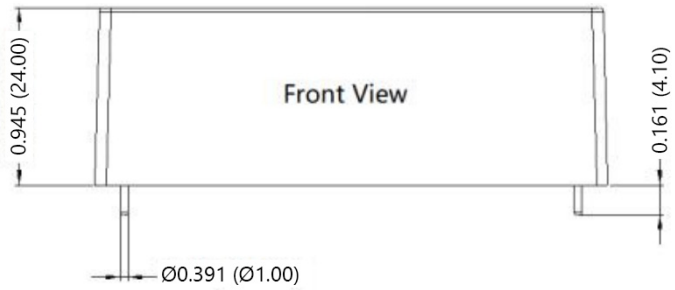
EMI Connection for Class I Equipment

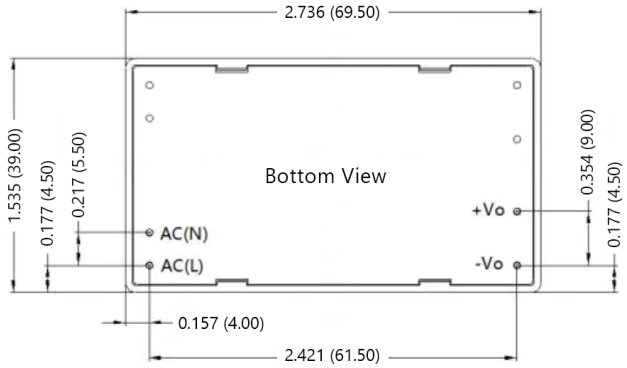


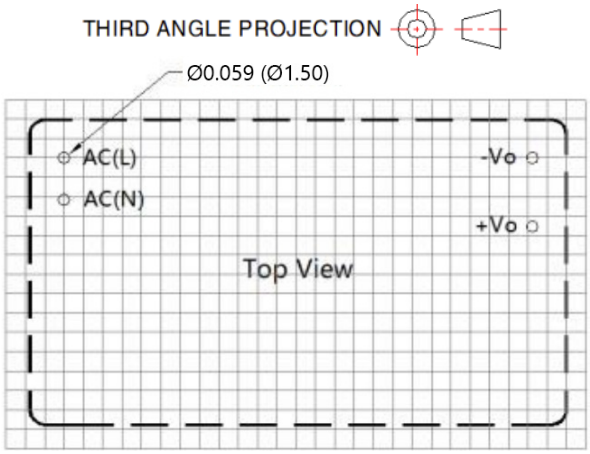
Component	Recommended Value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
CX	334K/305VAC
R1	6.8Ω/5W (wire-round resistor)
L1	1.2mH/0.5A
CY1/CY2	2.2nF/400VAC
CY3/CY4	1nF/400VAC
GDT	300V/1KA
LCM	20 mH

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

Mechanical Diagrams





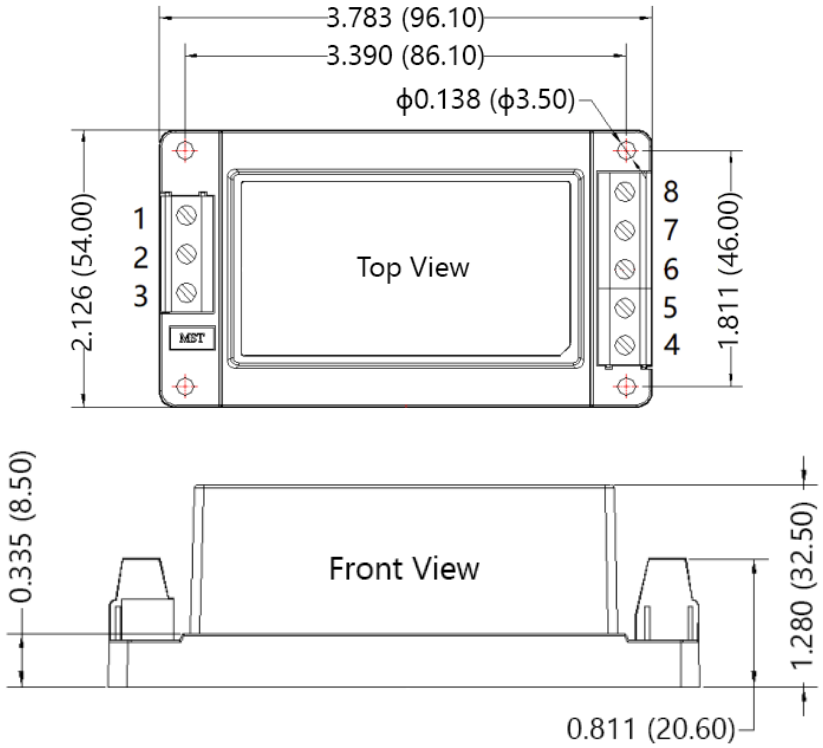


Note: Grid 0.1 * 0.1 in

Notes:

- All dimensions are typical in inches (mm)
- Pin diameter tolerances: ±0.004 (±0.10)
- General tolerances: ±0.020 (±0.50)
- Weight: 3.53 oz (100g)

A2S Chassis Mechanical Diagram



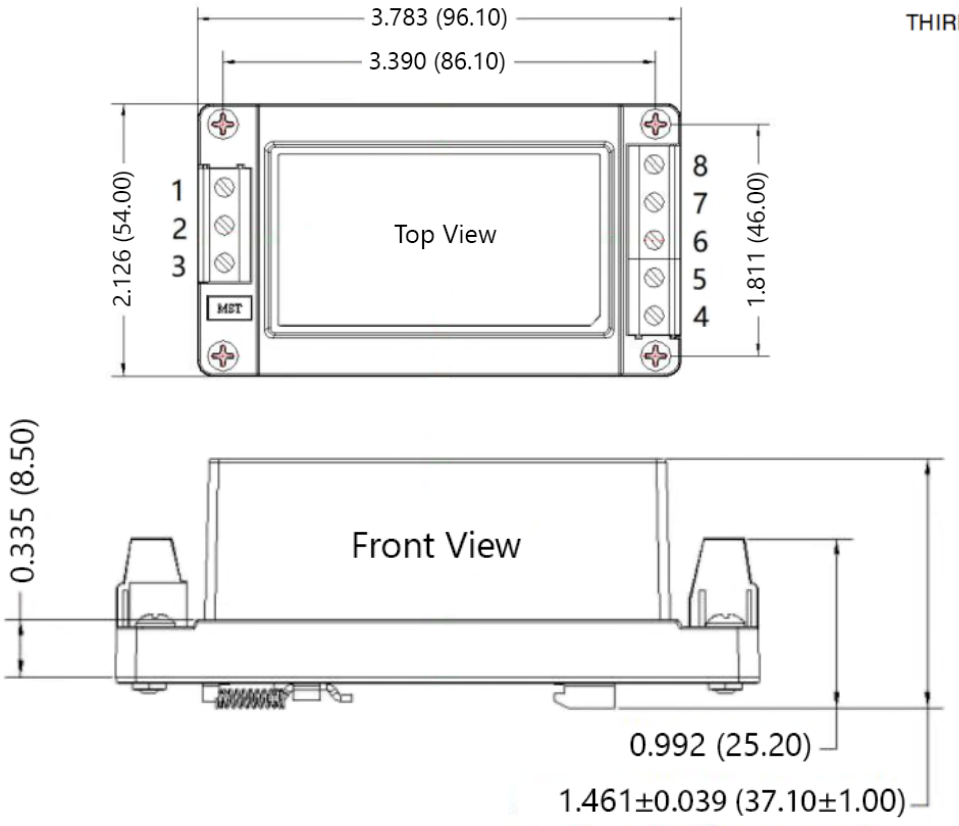
THIRD ANGLE PROJECTION

Pin-Out	
Pin	**Function**
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

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

Weight:
- 5.19 oz (147g)

A4S DIN-Rail Mechanical Diagram



THIRD ANGLE PROJECTION

Pin-Out	
Pin	**Function**
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

Notes:
- All dimensions are typical in inches (mm)
- Wire range: 24-12 AWG
- Tightening torque: Max 0.4 N·m
- General tolerances: ±1.00 (±0.039)
- Mounting Rail: TS35, connect safety ground

Weight:
- 6.70 oz (190g)