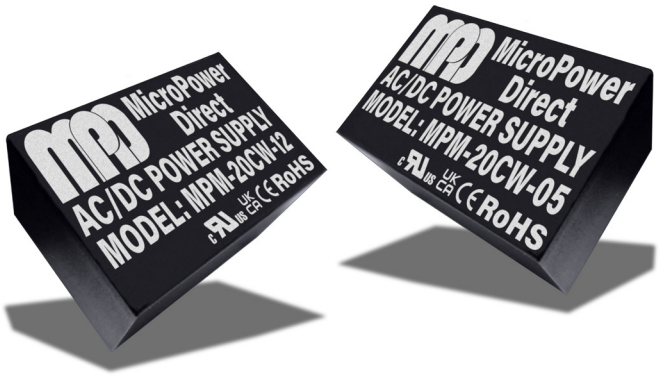
MPM-20CW

20W, Compact, High Isolation AC/DC Power Supplies



Key Features:

- 20W Output Power
- 90 - 528 VAC Input
- 4,000 VAC Isolation
- Compact Size
- Efficiency to 83%
- -40°C to +70°C Temp
- Meets EN 55032 B
- UL 62368 Approval
- >300 kHour MTBF
- Reinforced Insulation

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	90		528	VAC
	DC Input	100		745	VDC
Input Frequency		47		63	Hz
Input Current	115 VAC			0.8	A
	230 VAC			0.4	
Inrush Current	115 VAC		35		A
	230 VAC		60		
Leakage Current	230VAC / 50Hz			0.25	mA RMS
Recommended External Fuse	3.15A/500V, slow blow, required				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy	3.3V		±3		%
	Others		±2		
Line Regulation	Full Load		±0.5		%
Load Regulation	0 to 100% Load		±1		%
Ripple & Noise (20 MHz)	20MHz Bandwidth			150	mV P-P
Standby Power Consumption				0.75	W
Hold-Up Time	230 VAC		35		ms
	400 VAC		100		
Temperature Coefficient			±0.02		%/°C
Temperature Derating	+55°C to +70°C	3.0			%/°C
	-40°C to -10°C	1.0			
Input Voltage Derating	90 - 110 VAC	2.0			%/VAC
	480 - 528 VAC	0.417			
Over Voltage Protection	3.3/5VDC output			7.5	VDC
	9VDC output			15	
	12/15VDC output			20	
	24VDC output			30	
Over Current Protection	Self-Recovery	130		400	%Io
Short Circuit Protection	Hiccup Mode (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage		4,000			VAC
Switching Frequency			65		kHz

EMI Characteristics

Parameter	Standard	Criteria
Radiated Emissions, See Page 3	CISPR32/EN 55032	B
Conducted Emissions	CISPR32/EN 55032	B

Environmental

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

Physical

Case Size	2.78 x 1.89 x 1.18 in (See Mechanical Dimensions on Pages 5 & 6)
Case Material	Flame Retardant, Non-Conductive, Black Plastic (UL94V-0)
Weight	5.64 oz (160g) (See Mechanical Dimensions on Pages 5 & 6)

Reliability Specifications

Parameter	Conditions		Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign		300			kHours
Safety Class				Class II		
Lead Temperature	See Note 5	Wave, 5 - 10s			260	°C
		Manual, 3 - 5s			360	

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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) (230VAC)
	115 VAC	230 VAC					
MPM-20CW-03	800	400	3.3	3600	11.88	10000	74
MPM-20CW-05	800	400	5	3600	18	10000	78
MPM-20CW-09	800	400	9	2230	20	7000	79
MPM-20CW-12	800	400	12	1660	20	5000	82
MPM-20CW-15	800	400	15	1330	20	3000	83
MPM-20CW-24	800	400	24	833	20	1000	83

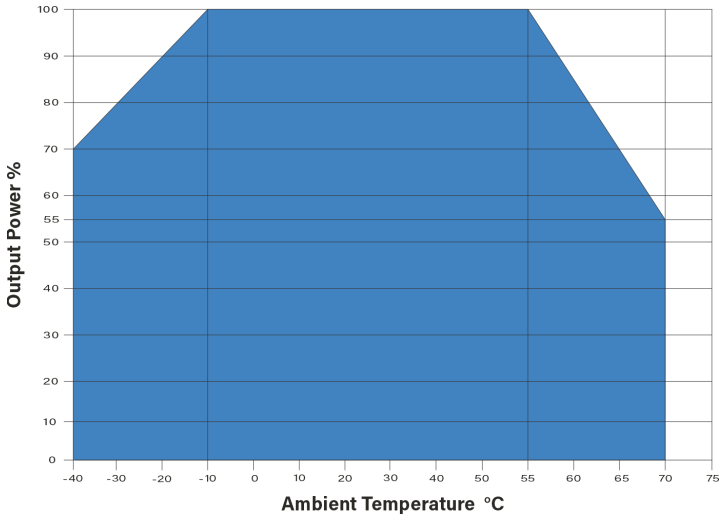
Notes:

1. The “parallel cable method” is used for ripple and noise test.
2. Unless otherwise specified, EMC performance indicators are tested according to typical connection circuit on page 4.
3. Output short circuit protection is provided by a "hiccup mode" circuit. The unit recovers automatically when the fault condition is removed.
4. Input-output isolation is tested for 60 seconds with a leakage current of <5 mA.
5. 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.

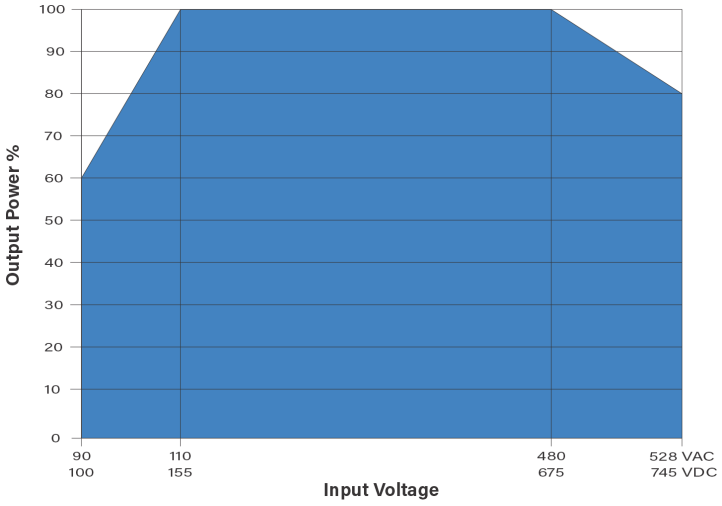
For the A2S chassis option, add the suffix "**-A2S**" to the model number (i.e. **MPM-20CW-12-A2S**). See Page 5.

For the A4S DIN rail option, add the suffix "**-A4S**" to the model number (i.e. **MPM-20CW-12-A4S**). See Page 6.

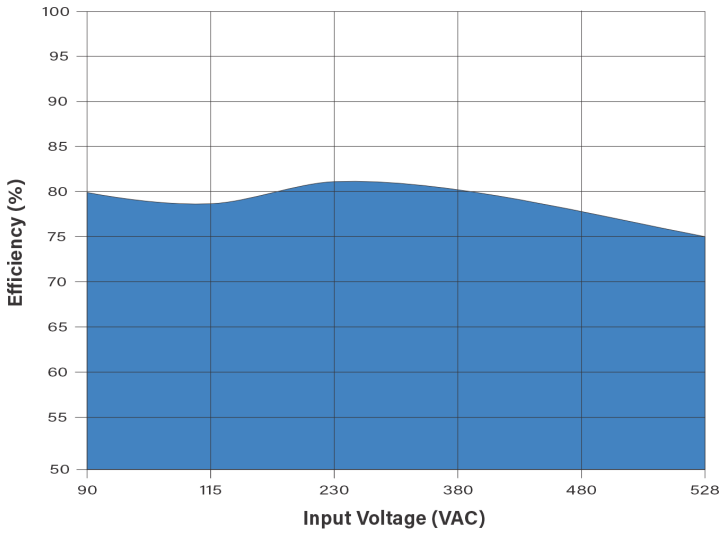
Temperature Derating



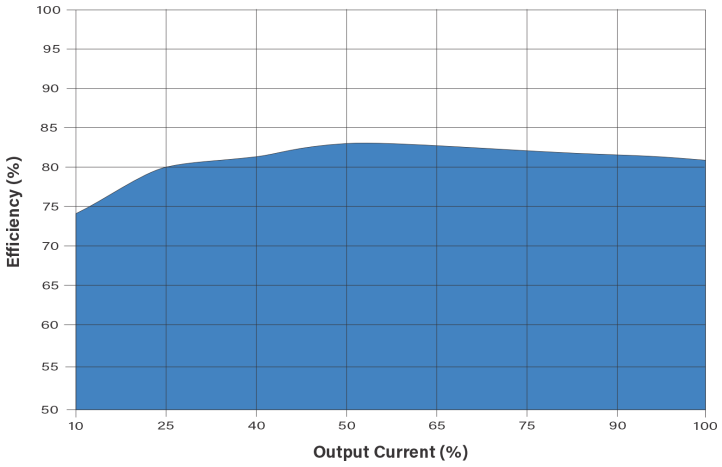
Input voltage Derating



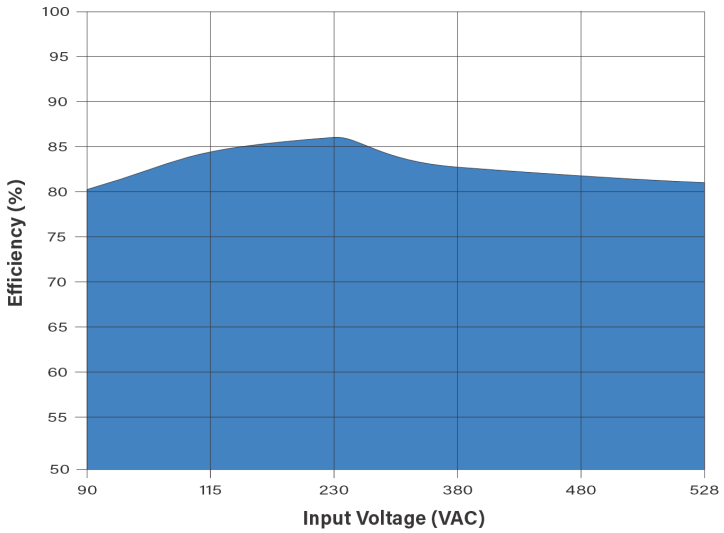
Efficiency vs Input Voltage: 5V (Full Load)



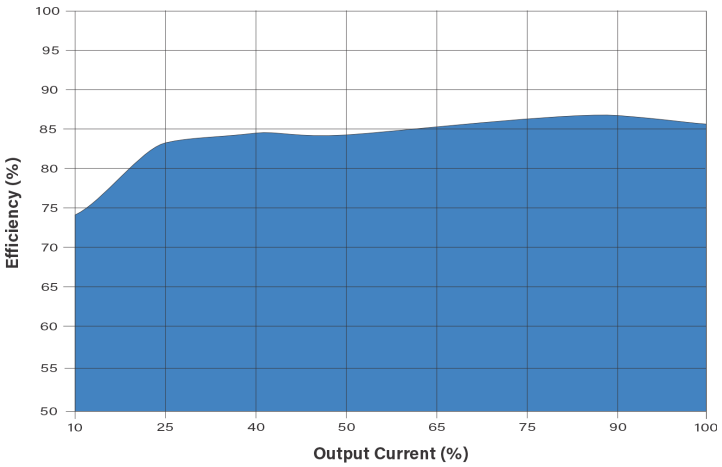
Efficiency vs Output Load: 5V (230VAC)



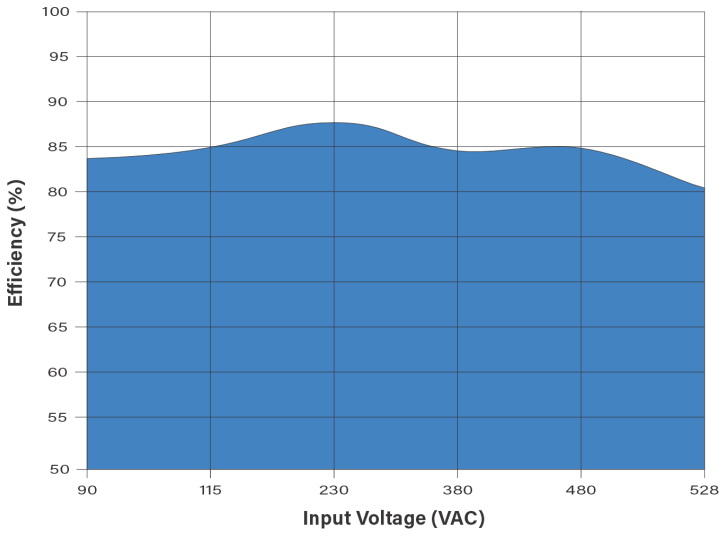
Efficiency vs Input Voltage: 12V (Full Load)



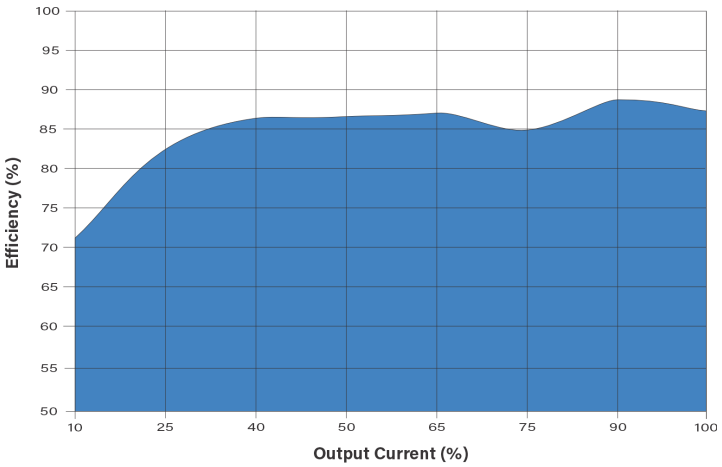
Efficiency vs Output Load: 12V (230VAC)



Efficiency vs Input Voltage: 24V (Full Load)



Efficiency vs Output Load: 24V (230VAC)

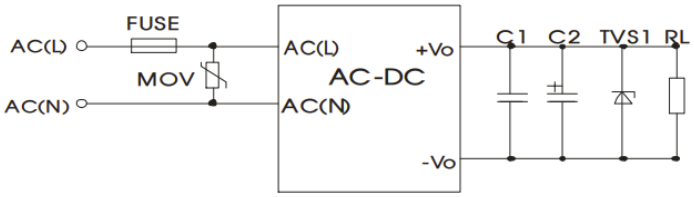


EMI Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions (RE)	CISPR32/EN55032		B
Conducted Emissions (CE)	CISPR32/EN55032		B
ESD	IEC/EN61000-4-2	B	Contact ±6kV/Air ±8kV
RS	IEC/EN61000-4-3	A	10V/m
EFT	IEC/EN61000-4-4	B	±2kV
	IEC/EN61000-4-4	B	±4kV (See EMC recommended circuits)
Surge	IEC/EN61000-4-5	B	line to line ±2kV
	IEC/EN61000-4-5	B	line to line ±4kV (See EMC recommended circuits)
CS	IEC/EN61000-4-6	A	10 Vr.m.s
Voltage Dips, Short, Interruption	IEC/EN61000-4-11	B	0%, 70%

Application Circuits

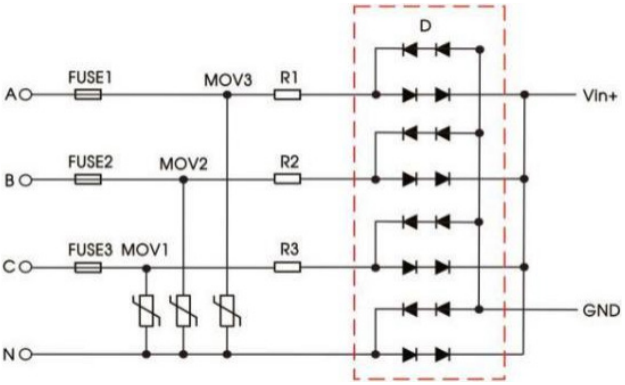
Typical Connection Diagram



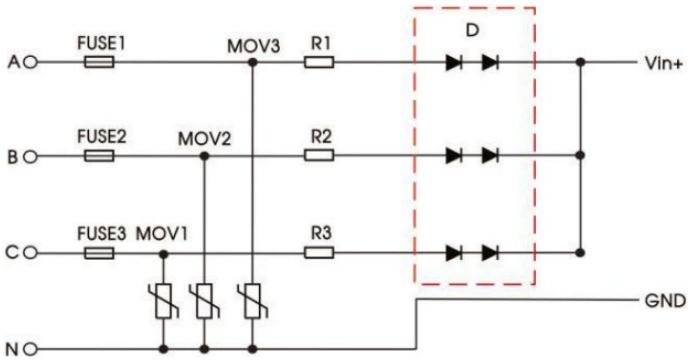
Part No.	FUSE	MOV	C2 (uF)	TVS1
3	3.15A / 500VAC, slow-blow, required	S20K625	330	SMBJ7.0A
5			330	SMBJ7.0A
9			220	SMBJ12A
12			220	SMBJ20A
15			220	SMBJ20A
24			220	SMBJ30A

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.

EMC Recommended Circuits



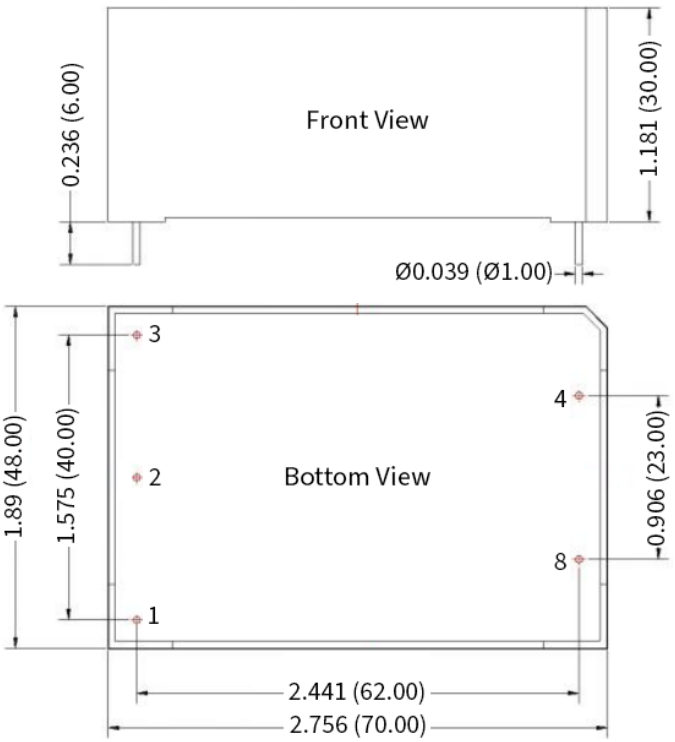
Recommended circuit for applications which require 4KV differential-mode inrush standard (full-wave rectification).

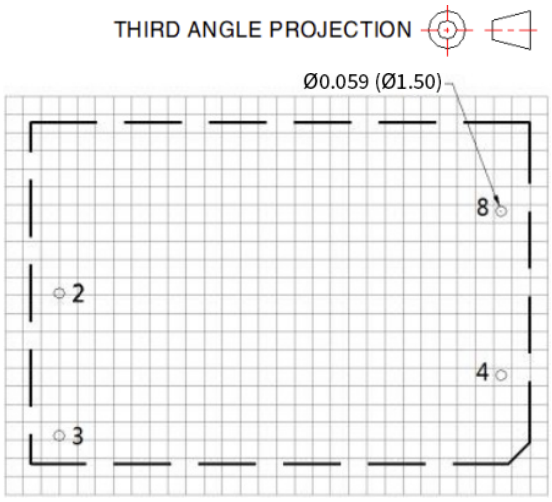


Recommended circuit for applications which require 4KV differential-mode inrush standard (half-wave rectification).

Component	Recommended Value
MOV1, MOV2, MOV3	S20K510
D	2A/100V
R1/R2/R3	10Ω/5W
FUSE1, FUSE2, FUSE3	3.15A/500VAC, slow-blow, required

Mechanical Dimensions





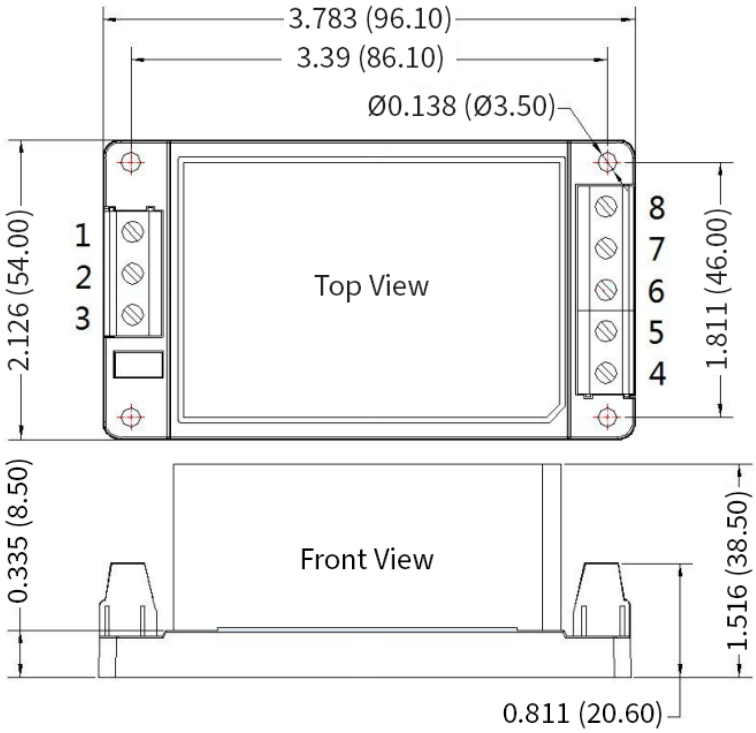
Note: Grid 2.54 * 2.54 mm

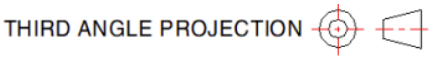
Pin-Out	
Pin	**Function**
1	No Pin
2	AC(N)
3	AC(L)
4	+Vo
8	-Vo

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

Weight:
- Horizontal Package: 5.64 oz (160g)

A2S Chassis



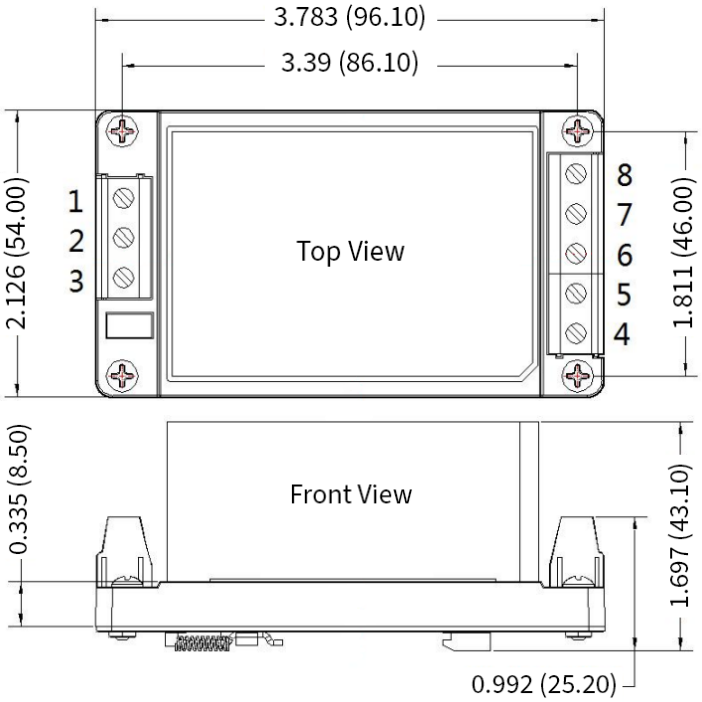


Pin-Out	
Pin	**Function**
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

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:
- A2S Chassis: 7.41 oz (210g)

A4S DIN Rail



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)
- Mountaing rail: TS35, connect to ground

Weight:
- A4S DIN Rail: 8.82 oz (250g)

MPD has a very wide range of high performance AC/DC power supplies ranging from 600W UChannel units to 1W units in miniature Single-In-Line (SIP) packages. All are designed and certified to international safety and EMC/EMI standards.
We have AC/DC supplies approved for use in medical equipment, DIN rail supplies, "Green" energy supplies and constant power supplies.
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