



PDM-60-xx(M)-y Series



CE EN62368-1 (PDM-60-xx-y)

RoHS Reach



Features

- Ultra-wide 85 - 305VAC and 100 - 430VDC (PDM-60-xx-y) input voltage range
- Operating ambient temperature range: -40°C to +85°C (M version: up to +90°C)
- High I/O isolation test voltage up to 4200VAC (M version: up to 4300VAC)
- EMI performance meets CISPR32/EN55032 CLASS B
- 5000m altitude application
- Panel montage & DIN montage option

Selection Guide

TYPE	Output			Efficiency (%) Typ. at 230Vac	Capacitive Load (µF) Max.
	POWER (W)	Voltage (VDC)	Current (mA) Typ.		
PDM-60-12M	60	12	5000	87.5	5000
PDM-60-15M		15	4000	89	3000
PDM-60-24M		24	2500	90	1800
PDM-60-48M		48	1250	91	470
PDM-60-05-y	50	5	10000	89	20000
PDM-60-12-y	60	12	5000	91	5000
PDM-60-15-y		15	4000	90	3000
PDM-60-24-y		24	2500	90	1800
PDM-60-48-y		48	1250	91	470
PDM-60-55-y	60.5	55.5	1090	91	470

Note: 1. y = P – panel mounting option, y = D – din rail mounting option.

2. Version PDM-60-55-y does not involve expansion package.



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Specifications

Characteristic	Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage Range	AC input	85	--	305	VAC
		DC input (PDM-60-xx-y)	100	--	430	VDC
	Input Frequency		47	--	63	HZ
	Input Current (Inrush Current)	115VAC	--	(30)	1.8	A
		230VAC	--	(60)	1.0	
	Leakage Current	277VAC/50Hz	0.25mA RMS max.			
	Input Fuse		3.15A/300V, slow-blow, required			
Hot Plug		unavailable				
Output Specifications	Voltage Accuracy		--	±2.0	--	%
	Line Regulation	100% load	--	±1.0	--	
	Load Regulation	0-100% load	--	±1.5	--	
	Ripple & Noise (*)	20MHz bandwidth (peak to peak)	--	80	150	mV
	Standby Power Consumption	230Vac	--	0.3	0.45	W
	Temperature Coefficient		--	±0.02	--	%/°C
	Hold Up Time	115/230Vac	--	8/65	--	ms
	Short-circuit Protection		Hiccup, continuous, self-recover			
	Over-current Protection		≥140% I _o , self-recover			
	Over-voltage Protection (Hiccup or clamp)	5./12/15/24/48/55.5VDC	≤ 9/16/25/35/60/70VDC			
General Specifications	Operating Temperature		-40	--	+85	°C
	Storage Temperature		-40	--	+85	
	Isolation (Input-Output)	Electric Strength Test for 1min., leakage current <5mA	4200	--	--	VAC
	Insulation Resistance (Input-Output)	Test voltage at 500VDC	100	--	--	MΩ
	Storage Humidity	Non-condensing	--	--	95	%RH
	Soldering Temperature	Wave-soldering	260 ± 5°C; time: 5 - 10s			
		Manual-welding	360 ± 10°C; time: 3 - 5s			
	Power Derating	-40°C to -25°C (85-200VAC input)	3.33	--	--	% / °C
		-40°C to -25°C (200-305VAC input)	1.33	--	--	
		+40°C to +70°C (5VDC output)	1.5	--	--	
		+45°C to +70°C (85-165VAC input, 12/15/24/48/55.5VDC output)	1.8	--	--	
		+50°C to +70°C (≥165VAC input, 12/15/24/48/55.5VDC output)	2.25	--	--	
		+70°C to +85°C	2	--	--	
		85VAC - 100VAC	1.33	--	--	% / VAC
		277VAC - 305VAC	0.72	--	--	
2000m - 5000m	6.67	--	--	% / Km		
Altitude		--	--	5000	m	
Safety Class		CLASS II				
MTBF	MIL-HDBK-217F/25°C	≥ 500kHrs				
Cooling Method	Free air convection					



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Mechanical Specification	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)			
	Dimensions/Weight	PCB	70.00 x 48.00 x 27.00 mm/130g (typ.)		
		Panel Mounting version	96.10 x 54.00 x 35.50 mm/177g (typ.)		
		Din Mounting version	96.10 x 54.00 x 40.10 mm/220g (typ.)		

Note: *The "parallel cable" method is used for ripple and noise test, output parallel 47 μ F electrolytic capacitor and 1 μ F ceramic capacitor.

Specifications (M version)

Characteristic	Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Specifications	Input Voltage Range	Certified voltage	100	--	277	VAC	
		Rated input voltage	85	--	305		
	Input Frequency	Certified voltage	50	--	60	HZ	
			47	--	63		
	Input Current (Inrush Current)	Certified voltage (M version)	115VAC	--	(30)	1.8	A
			230VAC	--	(60)	1.0	
			277VAC (M version)	--	--	0.9	
Leakage Current	277VAC/50Hz	0.25mA RMS max.					
Hot Plug		unavailable					
Output Specifications	Voltage Accuracy	Full load range	--	± 2.0	--	%	
	Line Regulation	Rated load	--	± 0.5	--		
	Load Regulation	0-100% load	12V	--	± 1.0		--
			15/24/48V	--	± 0.5	--	
	Ripple & Noise (*)	20MHz bandwidth (peak to peak)	12V	--	--	120	mV
			15/24V	--	--	150	
			48V	--	--	240	
	Standby Power Consumption	230Vac	--	--	0,15		
	Temperature Coefficient	M version	--	± 0.03	--	%/°C	
	Hold Up Time	115/230Vac	--	12/30	--	ms	
Short-circuit Protection	Recovery time <3s after the short circuit disappear	Hiccup, continuous, self-recover					
Over-current Protection		$\geq 115\%$ Io, hiccup, self-recover					
Over-voltage Protection (Output voltage clamp)	12/15/24/48VDC	$\leq 16/20.25/32.4/60$ VDC					
General Specifications	Operating Temperature		-40	--	+90	°C	
	Storage Temperature		-40	--	+90		
	Isolation (Input-Output)	Electric Strength Test for 1min., leakage current <5mA	4300	--	--	VAC	
	Insulation Resistance (Input-Output)	Test voltage at 500VDC	100	--	--	M Ω	
	Storage Humidity	Non-condensing	10	--	95	%RH	
	Operating Humidity		20	--	90		
	Soldering Temperature	Wave-soldering	260 \pm 5°C; time: 5 - 10s				
		Manual-welding	360 \pm 10°C; time: 3 - 5s				
Power Derating	-40°C to -25°C (<200VAC input)	4	--	--	%°C		
	-40°C to -25°C (>200VAC input)	0	--	--			



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		+50°C to +70°C	2.5	--	--	
		+70°C to +85°C	1.67	--	--	
		+85°C to +90°C	3	--	--	
		85VAC - 100VAC	1.33	--	--	%/VAC
		2000m - 5000m	3.5	--	--	%/Km
	Altitude		--	--	5000	m
	Safety Class		CLASS II			
	MTBF	MIL-HDBK-217F/25°C	≥ 1226.3kHrs			
	Cooling Method	Free air convection				
Mechanical Specification	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				
	Dimensions/Weight	87.00 x 52.00 x 29.50 mm/200g (typ.)				

Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 47μF electrolytic capacitor and 1μF ceramic capacitor.

Electromagnetic Compatibility (EMC)

Emissions (EMI)	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
Immunity (EMS)	ESD	IEC/EN 61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	±2KV	perf. Criteria A
			±4KV (See Fig. 2 for recommended circuit)	perf. Criteria A
	Surge	IEC/EN 61000-4-5	line to line ±2KV	perf. Criteria A
			line to line ±2KV/line to PE ±4KV (See Fig. 2 for recommended circuit)	perf. Criteria A
	CS	IEC/EN 61000-4-6	10V r.m.s	perf. Criteria A
Voltage dip, short interruption and voltage variation	IEC/EN 61000-4-11	0%, 70%	perf. Criteria B	

Electromagnetic Compatibility (EMC) M version

Emissions (EMI)	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
	Harmonic current	IEC/EN 61000-3-2	CLASS A	
	Voltage flicker	EN61000-3-3		
Immunity (EMS)	ESD	IEC/EN 61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	±2KV	perf. Criteria A
	Surge	IEC/EN 61000-4-5	line to line ±2KV	perf. Criteria A
			line to line ±2KV/line to PE ±4KV	perf. Criteria A
	CS	IEC/EN 61000-4-6	10V r.m.s	perf. Criteria A
	MS	IEC/EN 61000-4-8	30A/m	perf. Criteria A
Voltage variation (*)	IEC 61000-6-2/IEC 61000-4-11	70% Un, 25/30 cycle (50/60Hz) 40% Un, 10/12 cycle (50/60Hz) 0% Un, 1 cycle	perf. Criteria B	
Voltage interruption (*)	IEC 61000-6-2/IEC 61000-4-11	0% Un, 250/300 cycle (50/60Hz)	perf. Criteria C	

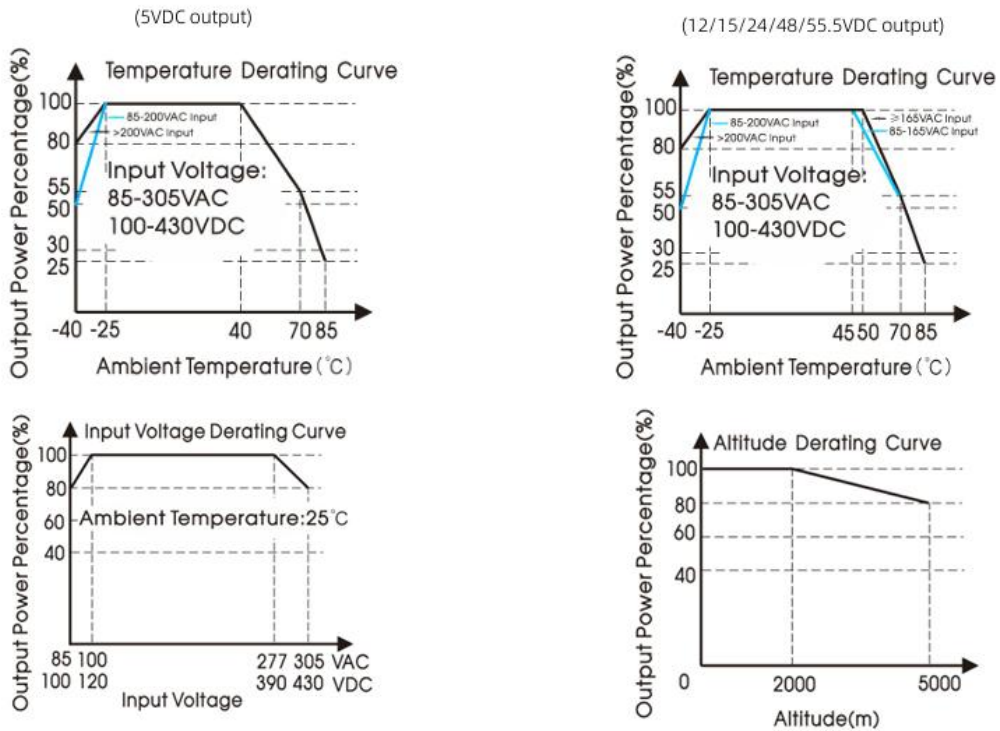
Note: *Un is the maximum input nominal voltage.



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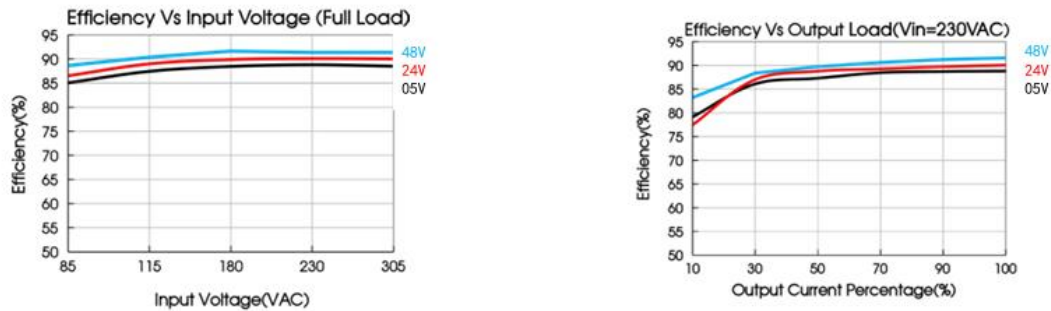
1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

Characteristic Curve



Note: ① With an AC input between 85-100VAC/277-305VAC and a DC input between 100-120VDC/390-430VDC, the output power must be derated as per temperature derating curves;

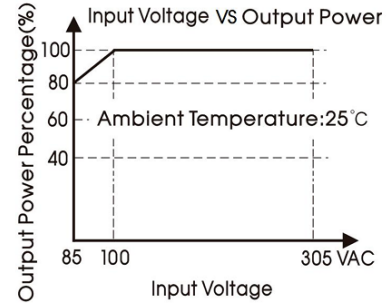
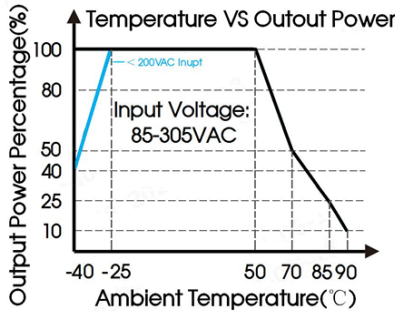
② This product is suitable for applications using natural air cooling.



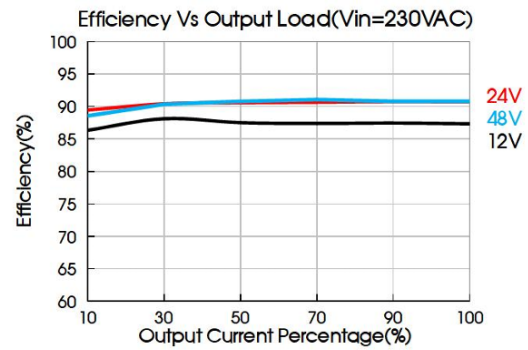
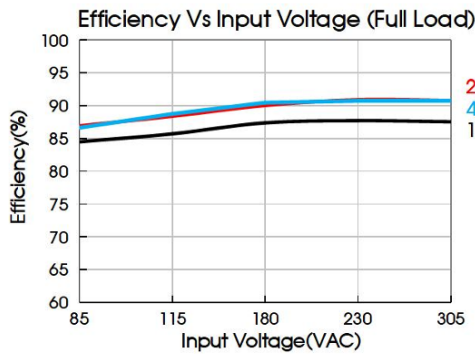


PDM-60-xx(M)-y Series

Characteristic Curve (M version)



Note: ① With an AC input between 85-100VAC the output power must be derated as per temperature derating curves;
 ② This product is suitable for applications using natural air cooling.



Design Reference PDM-60-xx

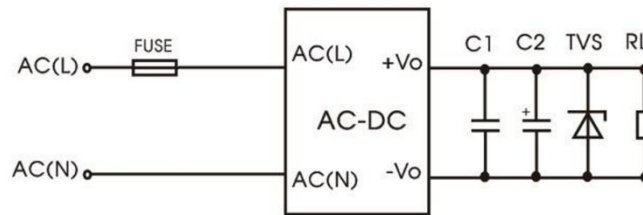


Fig. 1: Typical circuit diagram

Part No.	C1	C2	Fuse	TVS
PDM-60-05-y	1 μ F/50V	470 μ F/16V	3.15A / 300V, slow-blow, required	SMBJ10A
PDM-60-12-y		330 μ F/25V		SMBJ20A
PDM-60-15-y		330 μ F/25V		SMBJ30A
PDM-60-24-y		220 μ F/35V		SMBJ40A
PDM-60-48-y	1 μ F/100V	100 μ F/63V		SMBJ60A
PDM-60-55-y		100 μ F/100V		SMBJ60A

Output Filter Components: We recommend using an electrolytic capacitor with high frequency and low ESR rating for C2. Choose a capacitor voltage 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.

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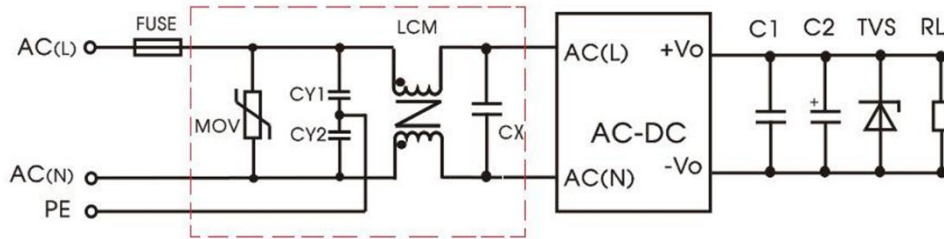


Fig. 2: EMC application circuit with higher requirements

Component	Recommended value
FUSE	3.15A / 300V, slow-blow, required
MOV	S14K350
CY1/CY2	1nF / 400VAC
CX	684K / 310V
LCM	20mH

Design Reference PDM-60-xx (M version)

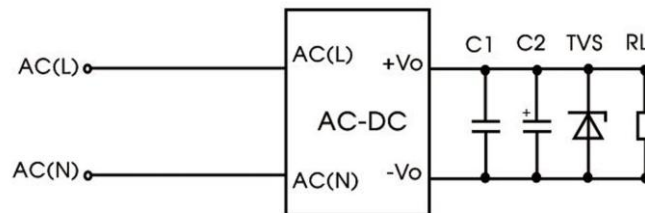


Fig. 3: Typical circuit diagram

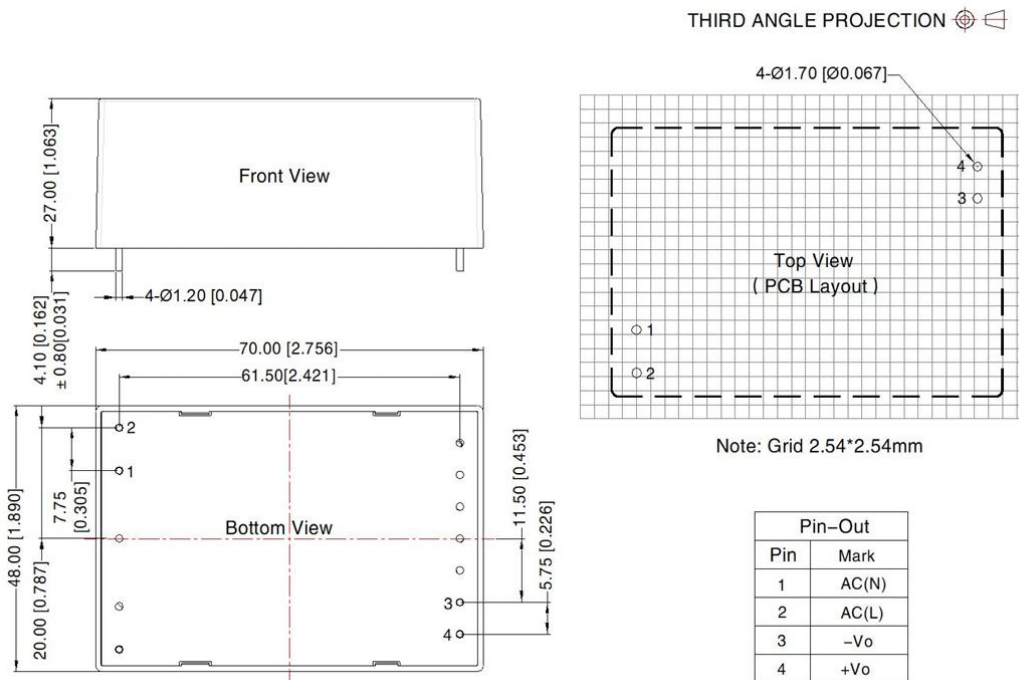
Part No.	C1	C2	TVS
PDM-60-12M	1 μ F/50V	330 μ F/35V	SMBJ20A
PDM-60-15M		330 μ F/35V	SMBJ20A
PDM-60-24M		200 μ F/35V	SMBJ30A
PDM-60-48M		100/63V	SMBJ60A

Output Filter Components: We recommend using an electrolytic capacitor with high frequency and low ESR rating for C2. Choose a capacitor voltage 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.

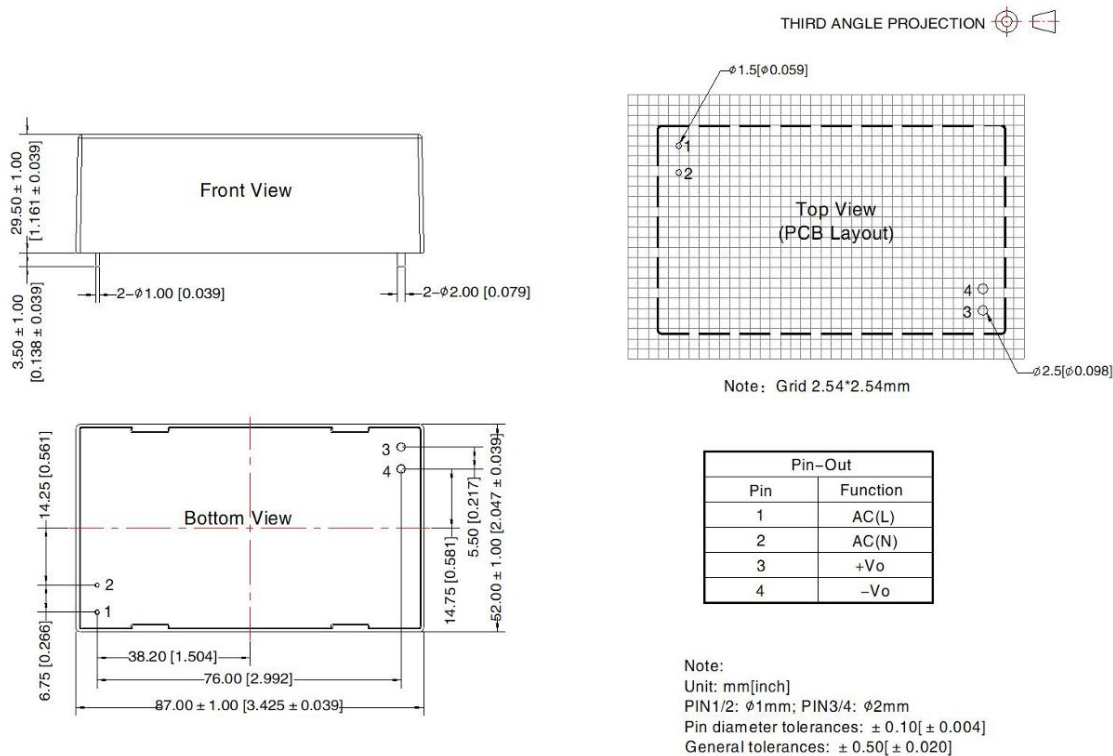


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Dimensions and Recommended Layout PDM-60-xx



Dimensions and Recommended Layout PDM-60-xx (M version)

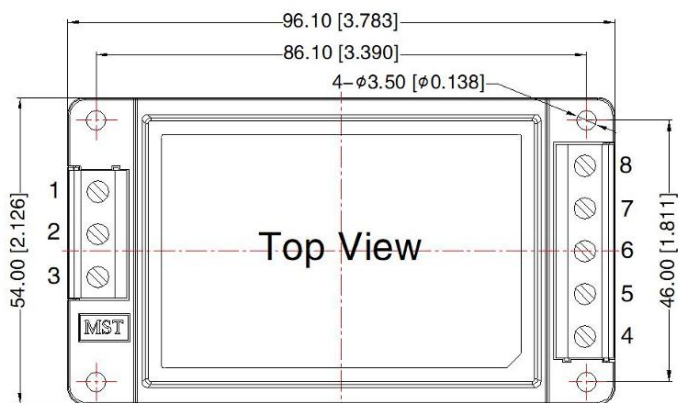


PDM-60-xx(M)-y Series

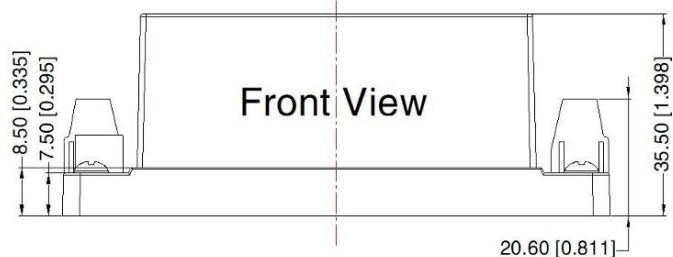
Dimensions of mechanical option PDM-60-xx-y

PANEL MOUNTING OPTION (y = P)

THIRD ANGLE PROJECTION 



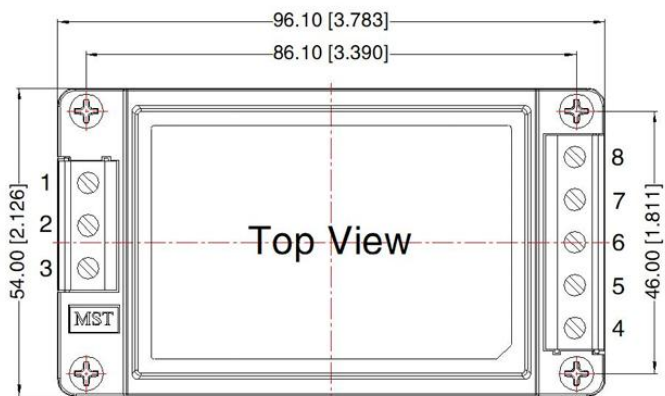
Pin-Out	
Pin	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo



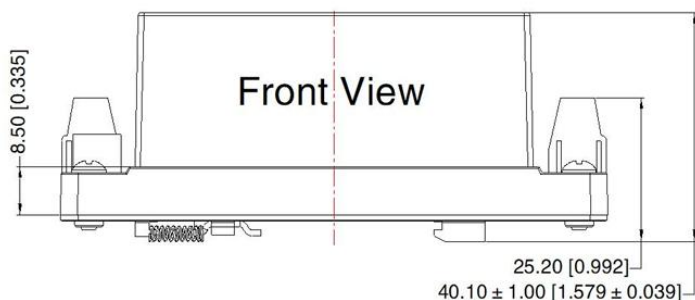
Note:
 Unit: mm[inch]
 Wire range: 24-12AWG
 Tightening torque: Max 0.4N · M
 General tolerances: ± 1.00[± 0.039]

DIN RAIL MOUNTING OPTION (y = D)

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



Note:
 Unit: mm[inch]
 Mounting rail: TS35, rail needs to connect safety ground
 Wire range: 24-12AWG
 Tightening torque: Max 0.4N · M
 General tolerances: ± 1.00[± 0.039]