APD10-xxMV0 Series

DESCRIPTIONS 10W, AC/DC Converter



RoHS

UL62368-1 EN62368-1 BS EN62368-1 IEC62368-1

FEATURES

- Ultra-wide 85 - 305VAC and 100 - 430VDC input voltage range
- Operating ambient temperature range: -40℃ to +85℃
- Up to 86% efficiency
- No-load power consumption < 0.1W
- 5000m altitude application
- EMI performance meets CISPR32/EN55032 CLASS B

APPLICATIONS

- Industrial control
- Electric power
- Medical treatment
- Home appliances
- Instrumentation
- Communication
- Civil applications
- AC Charging Station

Selection Guide

Certification	Part No.	Output Power	Peak Power	nominal Output Voltage and Current (Vo/Io)	Peak Current	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
UL/EN/ BS EN/IEC	APD10-03MV0	10W	13.2W	3.3V/3000mA	4000mA	82	6600
	APD10-05MV0		15W	5V/2000mA	3000mA	85	5000
	APD10-09MV0			9V/1100mA	1670mA	84	3000
	APD10-12MV0			12V/830mA	1250mA	85	2000
	APD10-15MV0			15V/660mA	1000mA	85	1500
	APD10-24MV0			24V/410mA	625mA	86	680

Note:The product picture is for reference only. For details, please refer to the actual product.

Specifications

Product Specifications	Item		Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage Range		AC input		85	--	305	VAC
			DC input		100	--	430	VDC
	Input Frequency				47	--	63	Hz
	Input Current		115VAC		--	--	0.45	A
			230VAC		--	--	0.3	
	Inrush Current		230VAC		--	60	--	
	Leakage Current		277VAC/50Hz		0.1mA RMS Max.			
	Built In Fuse				2A/300V, slow-blow			
	Hot Plug				Unavailable			
Output Specifications	Output Voltage Accuracy				--	±2	--	%
	Line Regulation		Full load		--	±0.5	--	
	Load Regulation		0%-100% load		--	±1	--	
	Ripple & Noise*		20MHz bandwidth (peak-to-peak value)		--	70	120	mV
	Stand-by Power Consumption		230VAC	3.3/5/9/12/15V	--	--	0.10	W
				24V	--	--	0.12	
	Temperature Coefficient				--	±0.02	--	%/℃
	Short Circuit Protection				Hiccup, continuous, self-recover			
	Over-current Protection				≥110%Io, self-recover			
	Over-voltage Protection		3.3/5V		≤7.5VDC (Output voltage clamp or hiccup)			
			9 V		≤15VDC (Output voltage clamp or hiccup)			
			12/15V		≤20VDC (Output voltage clamp or hiccup)			
			24V		≤30VDC (Output voltage clamp or hiccup)			
	Minimum Load				0	--	--	%
	Hold-up Time		115VAC		--	10	--	ms
			230VAC		--	55	--	
General Specifications	Isolation	Input-Output	Electric Strength Test for 1min., leakage current <5mA		4000	--	--	VAC
	Insulation Resistance	Input- output	At 500VDC		100	--	--	MΩ
	Operating Temperature				-40	--	+85	℃
	Storage Temperature				-40	--	+85	
	Storage Humidity				--	--	95	%RH
	Soldering Temperature		Wave-soldering		260 ± 5℃; time: 5 - 10s			
			Manual-welding		360 ± 10℃; time: 3 - 5s			
	Switching Frequency				--	65	--	kHz

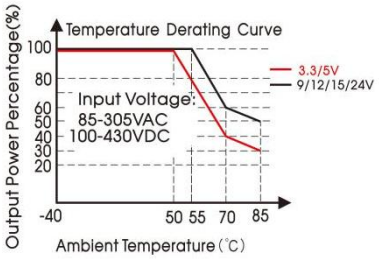
	Power Derating	+50℃ to +70℃	3.3/5V	3.00	--	--	%/℃
		+55℃ to +70℃	9/12/15/24V	2.67	--	--	
		+70℃ to +85℃		0.66	--	--	
		85VAC - 100VAC		1.33	--	--	%/VAC
		277VAC - 305VAC		0.71	--	--	
		2000 - 5000m		0.67	--	--	%/Km
	Safety Class			CLASS I I			
	MTBF	MIL-HDBK-217F@25℃		> 3200,000 h			
	Designed Life	230VAC	Ta: 25℃ 100% load	>130x10^3 h			
			Ta: 55℃ 100% load	>27x10^3 h			
Mechanical Specifications	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)					
	Dimension	47.60 x 26.80 x 23.50 mm					
	Weight	48g (Typ.)					
	Cooling method	Free air convection					

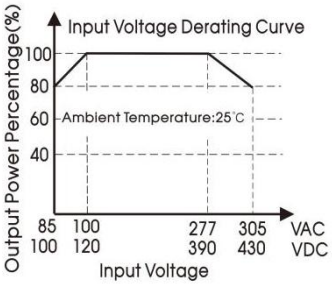
Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor.

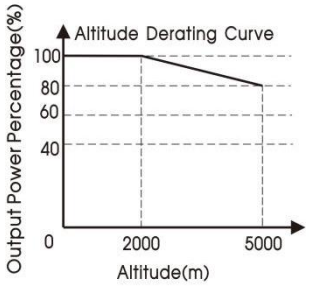
Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
			CISPR11/EN55011 CLASS B	
			EN55014-1	
		RE	CISPR32/EN55032 CLASS B	
			CISPR11/EN55011 CLASS B	
			EN55014-1	
	Immunity (EMS)	ESD	IEC/EN 61000-4-2 Contact ±8KV	perf. Criteria B
			IEC/EN55014-2	perf. Criteria B
		RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
			IEC/EN55014-2	perf. Criteria A
		EFT	IEC/EN61000-4-4 ±2KV	perf. Criteria B
			IEC/EN61000-4-4 ±4KV (See Fig.1 for typical application circuit)	perf. Criteria B
			IEC/EN55014-2	perf. Criteria B
		Surge	IEC/EN61000-4-5 line to line ±1KV	perf. Criteria B
			IEC/EN61000-4-5 line to line ±2KV (See Fig.1 for typical application circuit)	perf. Criteria B
			IEC/EN55014-2	perf. Criteria B
		CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
			IEC/EN55014-2	perf. Criteria A
		Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%, 70%	perf. Criteria B
			IEC/EN55014-2	perf. Criteria B

Characteristic Curve



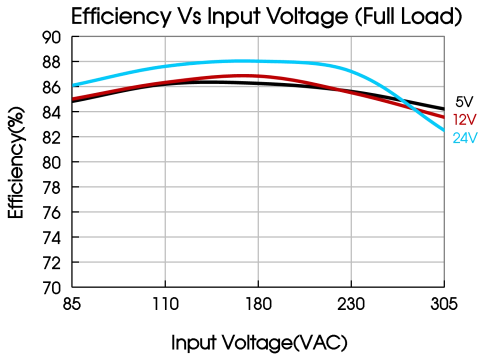


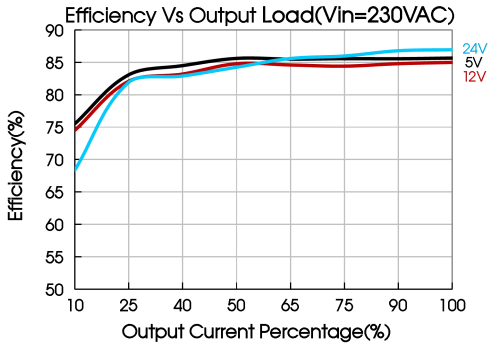


Note: ① The product takes peak power (15W) as the starting point for derating.

② With an AC input between 85-100V/277-305VAC and a DC input between 100-120V/390-430VDC, the output power must be derated as per temperature derating curves;

③This product is suitable for applications using natural air cooling.





Design Reference

1. Typical application

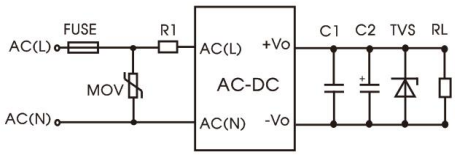


Fig. 1: Typical circuit diagram

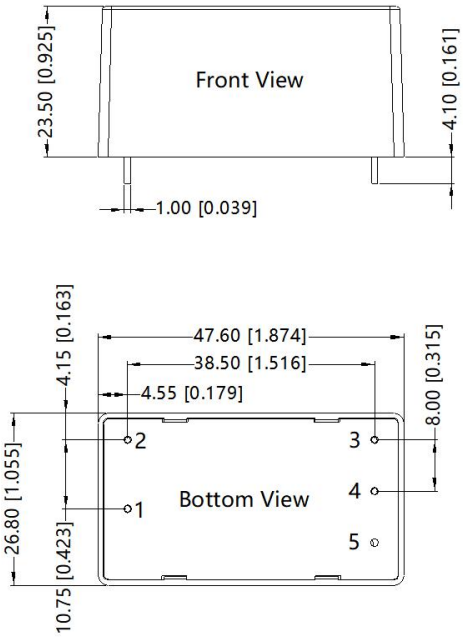
Part No.	FUSE	MOV	R1	C1	C2	TVS
APD10-03MV0	3.15A/300V, slow-blow, required	S14K350	6.8Ω/3W (wire-wound resistor, required)	1uF/50V	220uF/16V	SMBJ7.0A
APD10-05MV0					220uF/16V	SMBJ7.0A
APD10-09MV0					100uF/25V	SMBJ12A
APD10-12MV0					100uF/25V	SMBJ20A
APD10-15MV0					100uF/25V	SMBJ20A
APD10-24MV0					100uF/35V	SMBJ30A

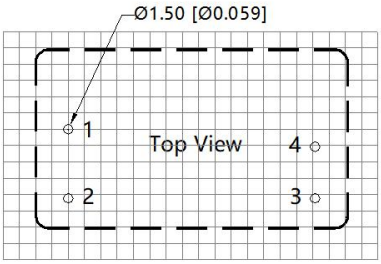
Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. 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.

Dimensions and Recommended

THIRD ANGLE PROJECTION





Note: Grid 2.54*2.54mm

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

Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]

Note:

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 Ta=25℃, 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.
7. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.