DESCRIPTIONS

15W, AC-DC Converter



RoHS

Report Report

UL62368-1 EN62368-1 BS EN62368-1

FEATURES

- Ultra-wide 176 - 418VAC and 248 - 591VDC input voltage range
- Operating ambient temperature range: -40℃ to +85℃
- Up to 85% efficiency
- No-load power consumption 0.3W
- 5000m altitude application
- Industrial-grade design
- EMI performance meets CISPR32/EN55032 CLASS B, EN55014

APPLICATIONS

- Industrial
- Electric power
- Instrumentation
- Communication
- AC Charging Station
- Smart home applications

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
EN/BS EN	APD15-4B-05	15W	5V/3000mA	81	3000
	APD15-4B-12		12V/1250mA	84	1000
	APD15-4B-15		15V/1000mA	84	560
UL/EN/BS EN	APD15-4B-24		24V/625mA	85	150

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	176	--	418	VAC
			DC input	248	--	591	VDC
	Input Certified Voltage Range		AC input	176	--	380	VAC
			DC input	248	--	550	VDC
	Input Frequency			47	--	63	Hz
	Input Current		220VAC	--	--	0.30	A
	Inrush Current		220VAC	--	30	--	
	Leakage Current		277VAC/50Hz	0.25mA RMS Max.			
	Recommended External Input Fuse			2A, slow-blow, required (The actual use needs to be selected according to the application environment)			
	Hot Plug			Unavailable			
Output Specifications	Output Voltage Accuracy			--	±3	±5	%
	Line Regulation		Full load	--	±1	±1.5	
	Load Regulation		10%-100% load	--	±1.5	±3	
	Ripple & Noise*		20MHz bandwidth (peak-to-peak value), 10%-100% load	--	--	150	mV
	Stand-by Power Consumption		220VAC	--	0.3	0.5	W
	Short Circuit Protection			Hiccup, continuous, self-recover			
	Over-current Protection			≥110%Io, self-recover			
	Minimum Load*			10	--	--	%
	Hold-up Time		220VAC	--	8	--	ms
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
	Thermal Shock		-40℃ to +85℃, Temperature Holding Time: t=30min.	500	--	--	H
	Soldering Temperature		Wave-soldering	260 ± 5℃; time: 5 - 10s			
			Manual-welding	360 ± 10℃; time: 3 - 5s			
	Switching Frequency			--	85	--	kHz
General Specifications	Power Derating		-40℃ to -25℃ (≥200VAC)	1.33	--	--	%/℃
			+50℃ to +70℃	3.00	--	--	
			+70℃ to +85℃	0.66	--	--	

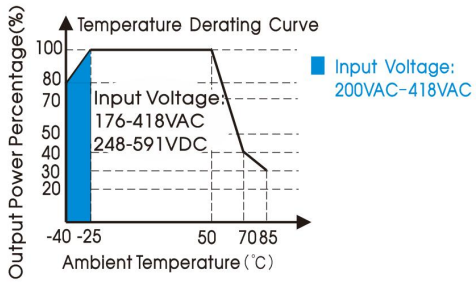
		380VAC - 418VAC	0.526	--	--	%/VAC
		2000 - 5000m	6.7	--	--	%/Km
	Safety Class		CLASS I I			
	MTBF	MIL-HDBK-217F@25℃	>1,000,000 h			
Mechanical Specifications	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				
	Dimension	52.40 x 27.20 x 24.00 mm				
	Weight	55g (Typ.)				
	Cooling method	Free air convection				

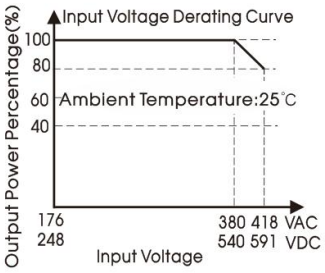
Note: 1. *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacito.
2. *The product is able to work with 0%-10% load and with stable output.

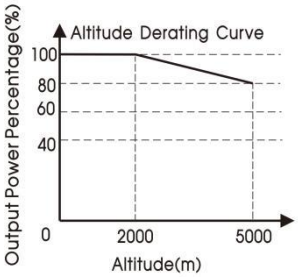
Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
			EN55014-1	
		RE	CISPR32/EN55032 CLASS B	
			EN55014-1	
	Immunity (EMS)	ESD	IEC/EN61000-4-2 Contact ±8KV/Air ±10KV	perf. Criteria A
			IEC/EN55014-2	perf. Criteria A
		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. 2 for recommended circuit)	perf. Criteria B
			IEC/EN55014-2	perf. Criteria B
		Surge	IEC/EN61000-4-5 line to line ±1KV	perf. Criteria A
			IEC/EN61000-4-5 line to line ±2KV/line to PE ±4KV (See Fig. 2 for recommended circuit)	perf. Criteria A
			IEC/EN55014-2	perf. Criteria A
		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

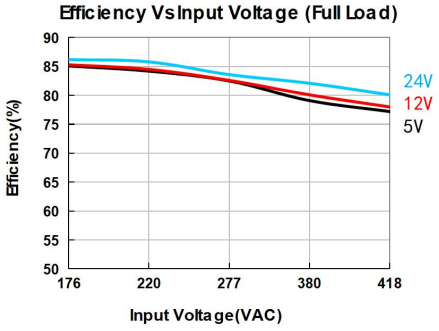
Characteristic Curve

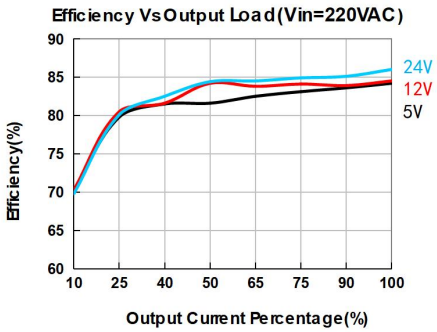






Note: ① With an AC input between 380-418VAC and a DC input between 540-591VDC, the output power must be derated as per temperature derating curves;
② This product is suitable for applications using natural air cooling.





Design Reference

1. Typical application

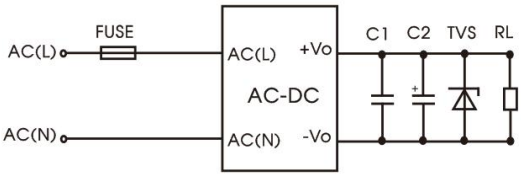


Fig. 1: Typical circuit diagram

Part No.	FUSE	C1	C2	TVS
APD15-4B-05	2A/300V, slow-blow, required (176-305VAC input); 2A/500V, slow-blow, required (176-418VAC input);	1uF/50V	220uF/16V	SMBJ7.0A
APD15-4B-12			100uF/25V	SMBJ20A
APD15-4B-15			100uF/25V	SMBJ20A
APD15-4B-24			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.

2. EMC compliance recommended circuit

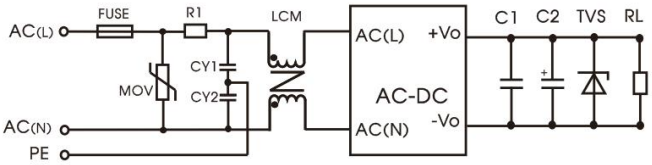
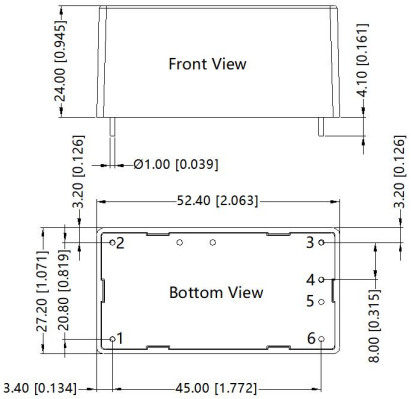


Fig. 2: EMC application circuit with higher requirements

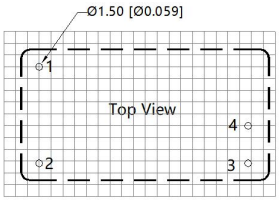
Component	Recommended value
FUSE	2A/300V, slow-blow, required (176-305VAC input) 2A/500V, slow-blow, required (176-418VAC input)
MOV	S10K350 (176-305VAC input); S10K510 (176-418VAC input)
R1	6.8Ω/3W
CY1/CY2	1nF/400VAC (176-305VAC input); 1nF/500VAC (176-418VAC input)
LCM	10mH

Dimensions and Recommended

THIRD ANGLE PROJECTION



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



Note: Grid 2.54*2.54mm

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

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.