DESCRIPTIONS

3W, AC/DC Converter



RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

FEATURES

- Universal 85-305VAC or 100-430VDC input voltage
- Operating ambient temperature range: -40℃ to +85℃
- Up to 78% efficiency
- High power density
- No-load power consumption 0.1W
- Output short circuit, over-current
- Plastic case meets UL94V-0 flammability

APPLICATIONS

- Industrial
- Electric power
- home appliances
- Instrumentation
- Communication
- Civil 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	APD03-03P	2W	3.3V/600mA	70	1500
EN/BS EN	APD03-05P	3W	5V/600mA	74	1500
--	APD03-06P		6V/500mA	76	1500
EN/BS EN	APD03-09P		9V/340mA	76	300
EN/BS EN	APD03-12P		12V/250mA	77	300
EN/BS EN	APD03-15P		15V/200mA	78	300
EN/BS EN	APD03-24P		24V/125mA	78	200

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	--	--	0.13	A
		230VAC	--	--	0.07	
	Inrush Current	115VAC	--	15	--	
		230VAC	--	25	--	
	Leakage Current	277VAC/50Hz	0.25mA RMS Max.			
	Recommended External Input Fuse		1A, slow-blow, required (The actual use needs to be selected according to the application enviroment)			
	Hot Plug		Unavailable			
Output Specifications	Output Voltage Accuracy		--	±5	--	%
	Line Regulation	Full load	--	±1.5	--	
	Load Regulation	10%-100% load	--	±3	--	
	Ripple & Noise*	20MHz bandwidth (peak-to-peak value), 10%-100% load; 3.3/5/6/9/12V; 230VAC input	--	--	100	mV
		20MHz bandwidth (peak-to-peak value), 10%-100% load; 3.3/5/6/9/12V; Others	--	--	120	
		20MHz bandwidth (peak-to-peak value), 10%-100% load; 15/24V	--	--	200	
	Temperature Coefficient		--	±0.15	--	%/℃
	Stand-by Power Consumption	230VAC	--	0.10	0.15	W
	Short Circuit Protection		Hiccup, continuous, self-recover			
	Over-current Protection		≥110%Io, self-recover			
	Minimum Load		10	--	--	%
	Hold-up Time	230VAC input	--	30	--	ms
General Specifications	Isolation Input-output	Electric Strength Test for 1min, leakage current <5mA	3600	--	--	VAC
	Operating Temperature		-40	--	+85	℃
	Storage Temperature		-40	--	+105	
	Storage Humidity		--	--	+95	%RH
	Soldering Temperature	Wave-soldering	260 ± 5℃; time: 5 - 10s			

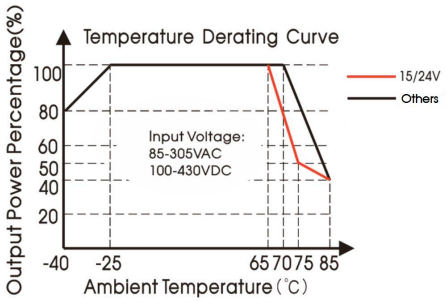
		Manual-welding	360 ± 10℃; time: 3 - 5s			
	Power Derating	-40℃ to -25℃	1.33	--	--	%/℃
		+70℃ to +85℃ (3.3/5/6/9/12V)	4.0	--	--	
		+65℃ to +75℃ (15/24V)	5.0	--	--	
		+75℃ to +85℃ (15/24V)	1.0	--	--	
		85VAC - 100VAC (-25℃ to +85℃)	1.33	--	--	%/VAC
		85VAC - 115VAC (-40℃ to -25℃)	2.0	--	--	
		277VAC - 305VAC	0.71	--	--	
	Safety Class		CLASS II			
	MTBF		MIL-HDBK-217F@25℃ > 300,000 h			
Mechanical Specifications	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				
	Dimension	37.50 x 18.50 x 13.60 mm				
	Weight	14.5g (Typ.)				
	Cooling method	Free air convection				

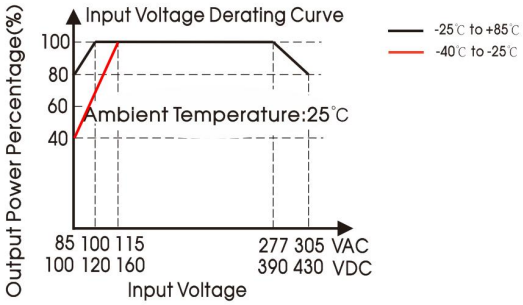
Note: 1. *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor;
2. The product is able to work with 0%-10% load and with stable output.

Electromagnetic Compatibility (EMC)

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

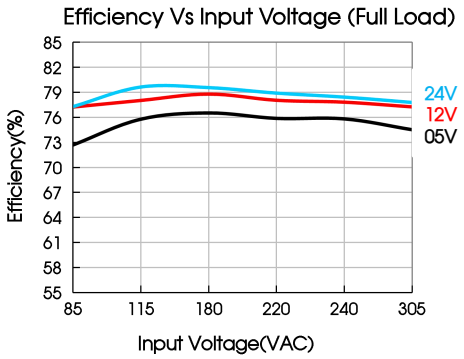
Characteristic Curve

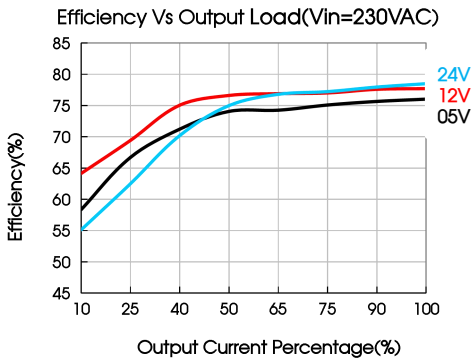




Note: ① With an AC input between 85-100V(115V)/277-305VAC and a DC input between 100-120V(160V)/390-430VDC, the output power must be derated as per temperature derating curves;

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





Design Reference

1. Typical application

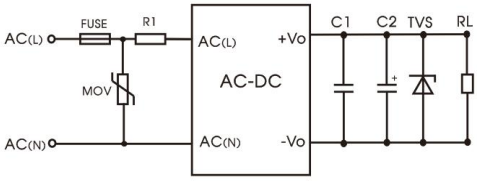


Fig. 1: Typical circuit diagram

Part No.	C1(uF)	C2(uF)	FUSE	R1	TVS	MOV
APD03-03P	1	150	1A/300V, slow-blow, required	24Ω/5W (wire-wound resistor)	SMBJ7.0A	S10K350
APD03-05P		150			SMBJ7.0A	
APD03-06P		150			SMBJ7.0A	
APD03-09P		120			SMBJ12A	
APD03-12P		120			SMBJ20A	
APD03-15P		120			SMBJ20A	
APD03-24P		68			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

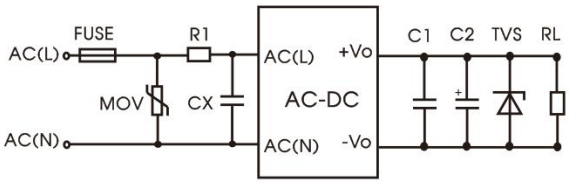


Fig. 2: EMC application circuit with higher requirements

Component	Recommended value
MOV	S10K350
R1	24Ω/5W (wire-wound resistor)
FUSE	2A/300V, slow-blow, required
CX	0.1uF/400VAC

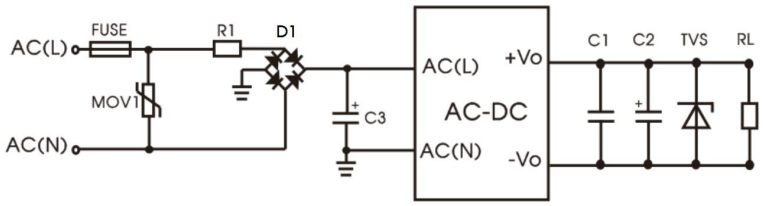
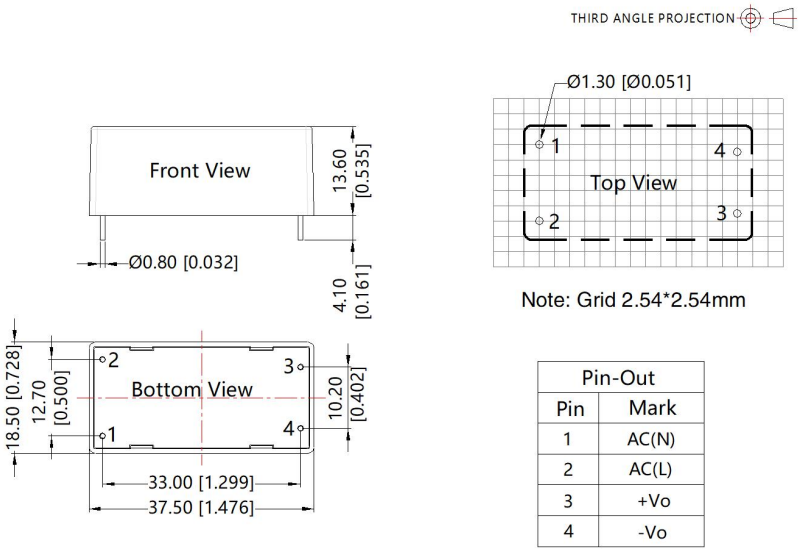


Fig. 3: EMC application circuit with higher requirements

Component	Recommended value
MOV1	S14K350
R1	24Ω/5W (wire-wound resistor)
FUSE	2A/300V, slow-blow, required
D1	1000V/1A
C3	10uF/450V

Dimensions and Recommended



Pin-Out	
Pin	Mark
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

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.