DESCRIPTIONS

60W，AC-DC Converter



RoHS

3 Years Warranty

CE Report UKCA Report

EN62368-1 BS EN62368-1

FEATURES

- Universal 85-305VAC input voltage
- Operating ambient temperature range: -40℃ to +90℃
- High I/O isolation test voltage up to 4300VAC
- Up to 91% efficiency
- No-load power consumption ≤0.15W
- Output short circuit, over-current, over-voltage protection
- 5000m altitude application
- OVC III (design to meet EN62368, 2000m altitude)
- Meets Emissions CLASS B and surge ±2KV without additional circuits

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	APD60-12M	60W	12V/5A	87.5	5000
	APD60-15M		15V/4A	89	3000
	APD60-24M		24V/2.5A	90	1800
	APD60-48M		48V/1.25A	91	470
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	Certified voltage		100	--	277	VAC
		Rated input voltage		85	--	305	
	Input Frequency	Certified voltage		50	--	60	Hz
				47	--	63	
	Input Current	Certified voltage		--	--	1.8	A
		115VAC		--	--	1.8	
		230VAC		--	--	1.0	
		277VAC		--	--	0.9	
	Inrush Current	115VAC		--	30	--	
		230VAC		--	60	--	
	Start-up Delay Time	115VAC		--	--	1	ms
		230VAC		--	--	2	
	Leakage Current	277VAC/50Hz		0.25mA RMS Max.			
	Hot Plug			Unavailable			
Output Specifications	Output Voltage Accuracy	Full load range		--	±2	--	%
	Line Regulation	Rated load		--	±0.5	--	
	Load Regulation	0% - 100% load	12V	--	±1	--	
			15V/24V/48V	--	±0.5	--	
	Minimum Load			0	--	--	
	Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	12V	--	--	120	mV
			15/24V	--	--	150	
			48V	--	--	240	
	Stand-by Power Consumption	230VAC		--	--	0.15	W
	Temperature Coefficient			--	±0.03	--	%/℃
	Hold-up Time	115VAC input		--	12	--	ms
		230VAC input		--	30	--	
	Short Circuit Protection	Recovery time <3s after the short circuit disappear		Hiccup, continuous, self-recover			
	Over-current Protection			≥115% Io, hiccup, self-recover			
	Over-voltage Protection	12V		≤16VDC (Output voltage clamp)			
		15V		≤20.25VDC (Output voltage clamp)			
		24V		≤32.4VDC (Output voltage clamp)			
		48V		≤60VDC (Output voltage clamp)			

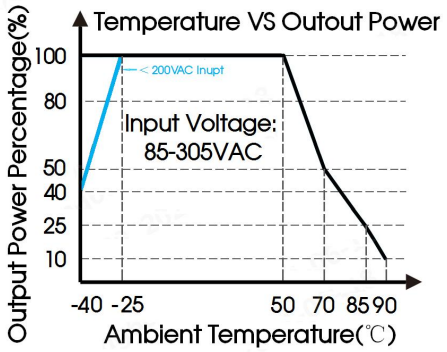
General Specifications	Isolation	Input-output	Electric Strength Test for 1min., leakage current <5mA	4300	--	--	VAC
	Insulation Resistance	Input - output	Test voltage at 500VDC	100	--	--	MΩ
	Operating Temperature			-40	--	+90	℃
	Storage Temperature			-40	--	+90	
	Storage Humidity		Non-condensing	10	--	95	%RH
	Operating Humidity			20	--	90	
	Soldering Temperature		Wave-soldering	260 ± 5℃; time: 5 - 10s			
			Manual-welding	360 ± 10℃; time: 3 - 5s			
	Power Derating		-40℃ to -25℃ (<200VAC input)	4	--	--	%/℃
			-40℃ to -25℃ (>200VAC input)	0	--	--	
			+50℃ to +70℃	2.5	--	--	
			+70℃ to +85℃	1.67	--	--	
			+85℃ to +90℃	3	--	--	
			85VAC - 100VAC	1.33	--	--	%/VAC
			2000m - 5000m	3.5	--	--	℃/Km
	Safety Class			CLASS II			
	MTBF		MIL-HDBK-217F@25℃	≥1226,300 h			
Mechanical Specifications	Case Material		Black plastic, flame-retardant and heat-resistant (UL94V-0)				
	Dimension		87.00 x 52.00 x 29.50 mm				
	Weight		200g (Typ.)				
	Cooling Method		Free air convection				
Note: *The "parallel cable" method is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 1uF ceramic capacitor,							

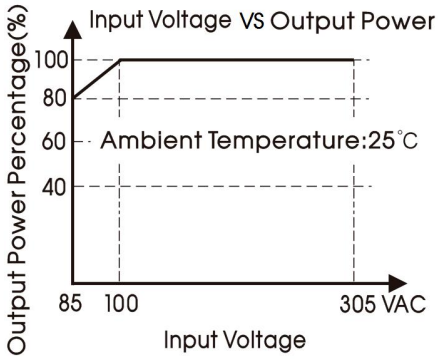
Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B		
		RE	CISPR32/EN55032 CLASS B		
		Harmonic current	IEC/EN61000-3-2 CLASS A		
		Voltage flicker	EN61000-3-3		
	Immunity (EMS)	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria A
		RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
		EFT	IEC/EN61000-4-4	±2KV	perf. Criteria A
		Surge	IEC/EN61000-4-5	line to line ±2KV	perf. Criteria A
			IEC/EN61000-4-5	line to line ±2KV/ line to PE ±4KV	perf. Criteria A
		CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
		MS	IEC/EN61000-4-8	30A/m	perf. Criteria A
		Voltage variation*	IEC61000-6-2/IEC61000-4-11	70% Un, 25/30 cycle(50/60Hz) 40% Un, 10/12 cycle(50/60Hz)	perf. Criteria B

				0% Un, 1 cycle	
		voltage interruption*	IEC61000-6-2/IEC61000-4-11	0% Un, 250/300 cycle(50/60Hz)	perf. Criteria C
Note: *Un is the maximum input nominal voltage.					

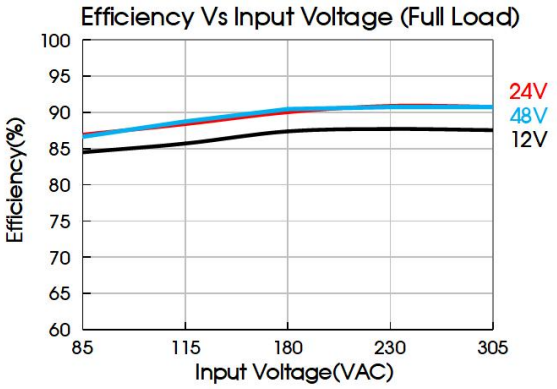
Characteristic Curve

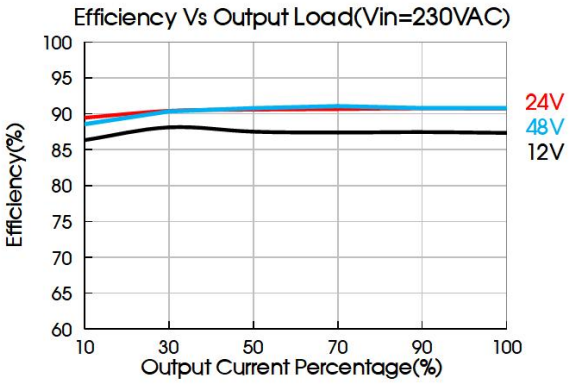




Note: ① With an AC input between 85-100VAC the output power must be derated as per temperature derating curves;

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





Design Reference

1. Typical application

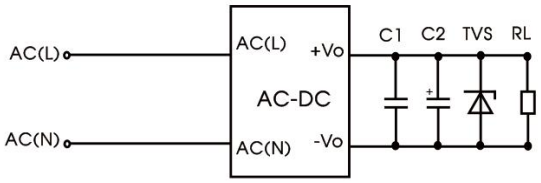


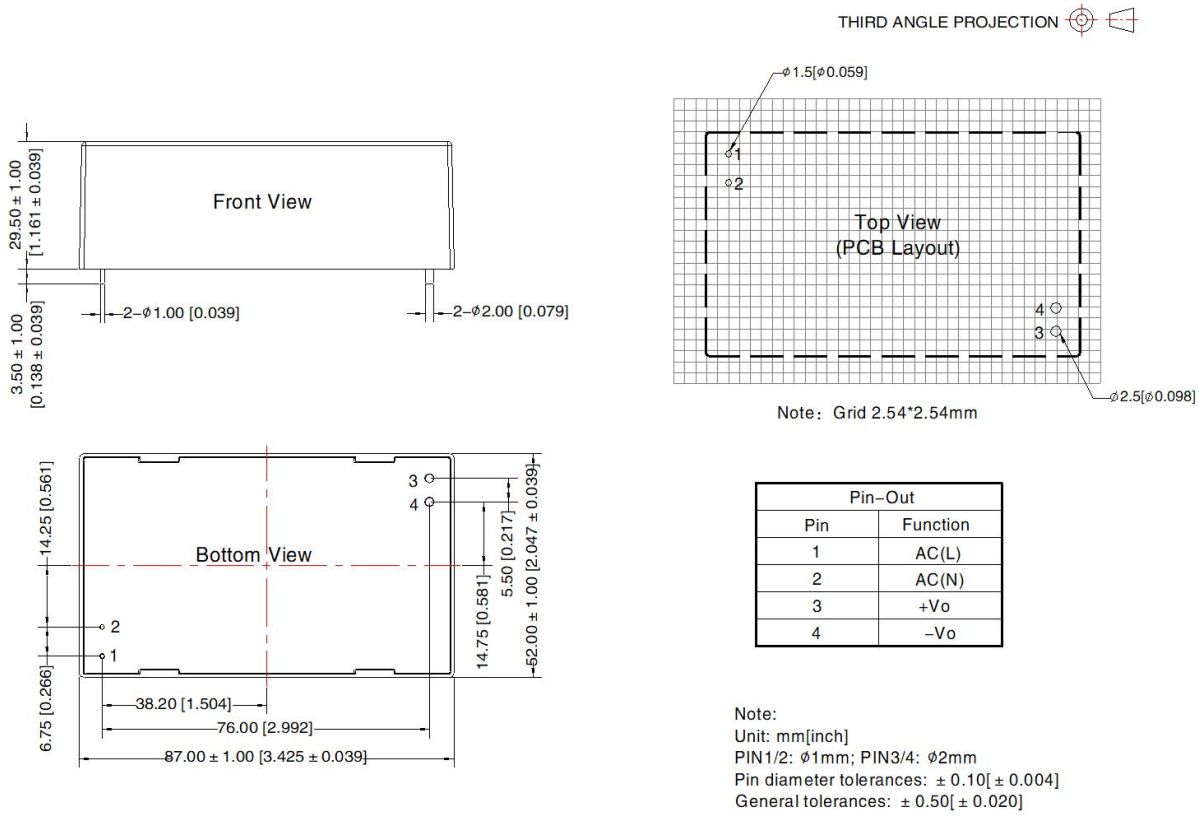
Fig. 1: Typical circuit diagram

Part No.	C1	C2	TVS
APD60-12M	1uF/100V	330uF/35V	SMBJ20A
APD60-15M		330uF/35V	SMBJ20A
APD60-24M		200uF/35V	SMBJ30A
APD60-48M		100uF/63V	SMBJ60A

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



Pin–Out	
Pin	Function
1	AC(L)
2	AC(N)
3	+Vo
4	–Vo

Note:
Unit: mm[inch]
PIN1/2: φ1mm; PIN3/4: φ2mm
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.