APDE60-2B-xx Series

DESCRIPTIONS

60W，AC-DC Converter



RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

FEATURES

- Universal 85-264VAC or 100-370VDC input voltage
- Operating ambient temperature range: -40℃ to +70℃
- High I/O isolation test voltage up to 4000VAC
- High reliability, high power density, high efficiency
- Output short circuit, over-current, over-voltage protection
- Regulated output, low ripple & noise
- Plastic case meets UL94V-0 flammability
- EMI performance meets CISPR32/EN55032 CLASS B

APPLICATIONS

- Industrial
- Electric power
- Home appliances
- 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	APDE60-2B-12	60W	12V/5000mA	87	4000
EN/BS EN	APDE60-2B-24	60W	24V/2500mA	89	1800

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

Specifications

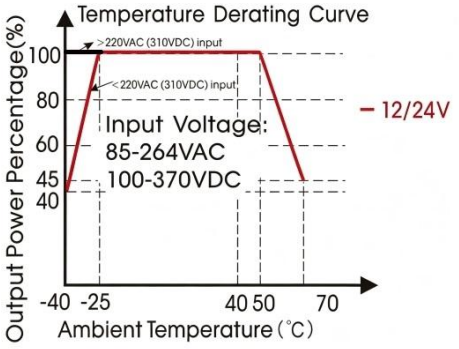
Product Specifications	Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage Range	AC input	85	--	264	VAC
		DC input	100	--	370	VDC
	Input Frequency		47	--	63	Hz
	Input Current	115VAC	--	--	1.8	A
		230VAC	--	--	1.0	
	Inrush Current	115VAC	--	45	--	A
		230VAC	--	90	--	
	Leakage Current	240VAC/50Hz	0.25mA RMS Max.			
	Built-in Fuse		3.15A/250V, 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)	--	--	120	mV
	Stand-by Power Consumption		--	--	0.5	W
	Temperature Coefficient		--	±0.02	--	%/℃
	Short Circuit Protection		Hiccup, continuous, self-recover			
	Over-current Protection		≥110%Io, self-recover			
	Over-voltage Protection	12VDC Output	≤16VDC (Output voltage clamp or hiccup)			
		24VDC Output	≤35VDC (Output voltage clamp or hiccup)			
	Minimum Load		0	--	--	%
	Hold-up Time	115VAC input	--	8	--	ms
		230VAC input	--	65	--	
General Specifications	Isolation Input-output	Electric Strength Test for 1min., leakage current <5mA	4000	--	--	VAC
	Operating Temperature		-40	--	+70	℃
	Storage Temperature		-40	--	+85	
	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℃ (85-220VAC input)	4.0	--	--	%/℃
		+50℃ to +70℃ (12V/24V output)	2.75	--	--	
		85VAC - 110VAC	0.8	--	--	%/VAC
	Safety Class		CLASS I I			
	MTBF	MIL-HDBK-217F@25℃	≥300,000 h			

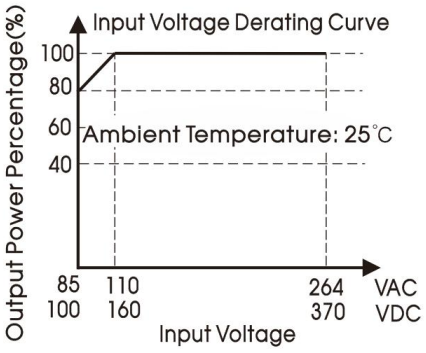
Mechanical Specifications	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)	
	Dimension	Horizontal package	87.00 x 52.00 x 29.50 mm
	Weight	Horizontal package	210g (Typ.)
	Cooling Method	Free air convection	
Note: *The "parallel cable" method is used for ripple and noise test.			

Electromagnetic Compatibility (EMC)

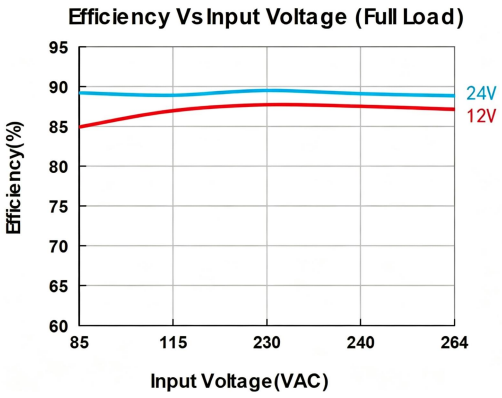
Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
		RE	CISPR32/EN55032 CLASS B	
	Immunity (EMS)	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	perf. Criteria B
		RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
		EFT	IEC/EN61000-4-4 ±4KV	perf. Criteria B
		Surge	IEC/EN61000-4-5 line to line ±1KV	perf. Criteria B
			IEC/EN61000-4-5 line to line ±2KV/line to PE ±4KV (See Fig. 2 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

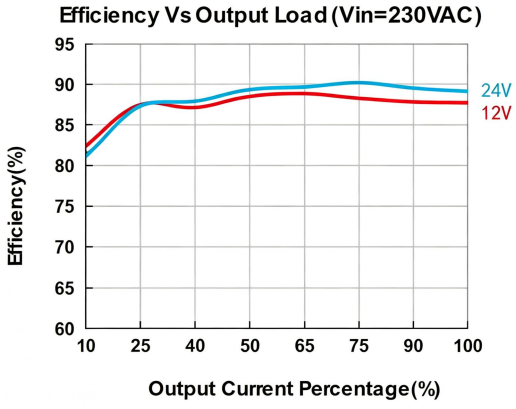
Characteristic Curve





Note: ① With an AC input between 85-110VAC and a DC input between 100-160VDC, 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

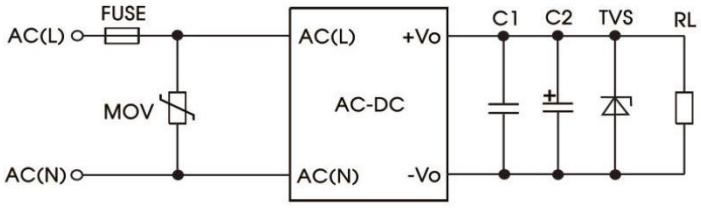


Fig. 1: Typical circuit diagram

Part No.	C1(uF)	C2(uF)	FUSE	MOV	TVS
APDE60-2B-12	1	330	3.15A/250V, slow-blow	S10K300	SMBJ20A
APDE60-2B-24		200			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

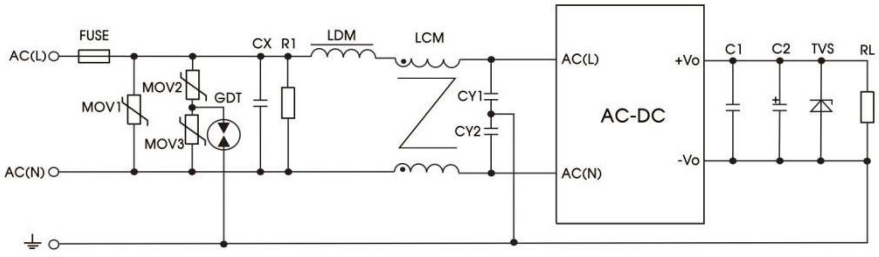
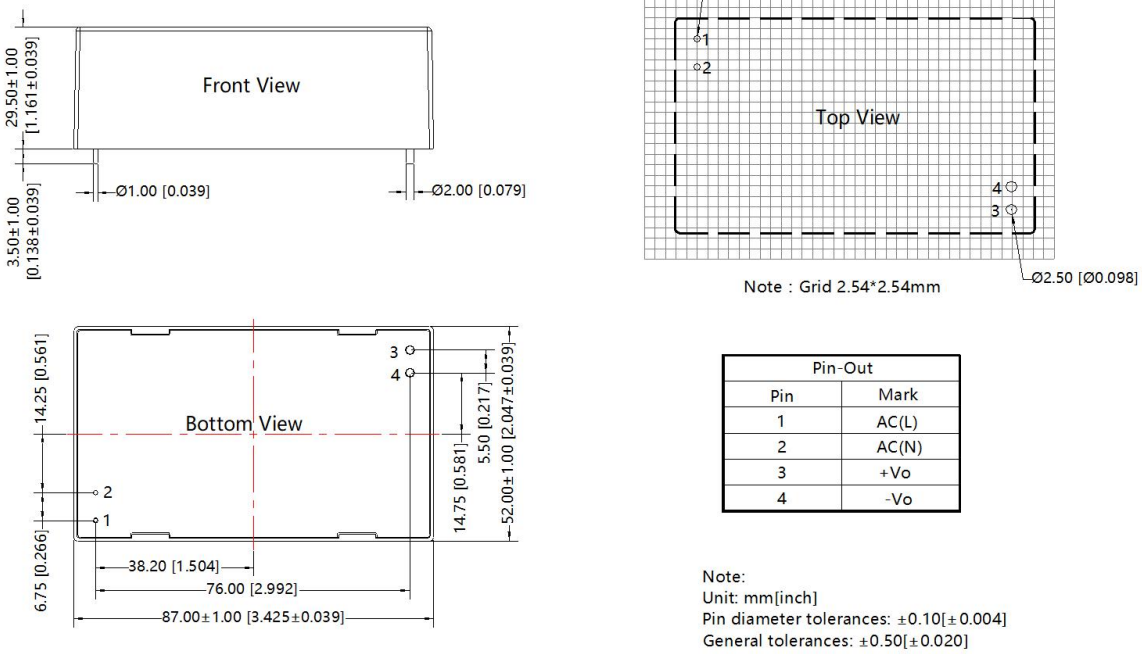


Fig. 2: EMC application circuit with higher requirements

Component	Recommended value
MOV1	S20K300
MOV2/MOV3	S10K300
CX	0.22uF/275VAC
CY1/CY2	1nF/400VAC
R1	1MΩ/2W
LDM	4.7uH
LCM	2mH
GDT	EM3600XS
FUSE	3.15A/250V, slow-blow, required

Dimensions and Recommended



Pin-Out	
Pin	Mark
1	AC(L)
2	AC(N)
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.