DESCRIPTIONS

50W，AC-DC Converter



RoHS

CE Report UKCA Report

EN62368-1 BS EN62368-1

FEATURES

- Specific power supply designing for smart grid
- Ultra-wide 85 - 305VAC and 88 - 430VDC input voltage range
- Ultra-wide operating ambient temperature range: -40℃ to +85℃
- High reliability, low output ripple & noise
- Immunity meets electricity standard Level 4
- Meets impulse voltage requirements of 1.2/50us 5KV
- Safety according to UL/IEC62368

APPLICATIONS

- Smart grid
- Microcomputer protection
- Bus voltage protection

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range ADJ (V)	Efficiency at 230VAC (%) Typ.	Capacitive Load (μF) Max.
EN/BS EN	AO50-03E	33W	3.3V/10A	2.97-3.63	84	20000
	AO50-05E	50W	5V/10A	4.5-5.5	86	20000
	AO50-09E	50.4W	9V/5.6A	8.1-9.9	86	10000
	AO50-12E	50.4W	12V/4.2A	10.8-13.2	86	8000
	AO50-15E	51W	15V/3.4A	13.5-16.5	86	4000
	AO50-24E	50.4W	24V/2.1A	21.6-26.4	87	2000
	AO50-27E	51.3W	27V/1.9A	24.3-29.7	88	2000
	AO50-48E	52.8W	48V/1.1A	43.2-52.8	89	1000

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	88	--	430	VDC
	Input Frequency			47	--	63	Hz
	Input Current		115VAC	--	--	1.2	A
			230VAC	--	--	0.8	
	Inrush Current		115VAC	--	20	--	
			230VAC	--	40	--	
	Contact Leakage Current		277VAC	0.5mA RMS max.			
	Hot Plug			Unavailable			
Output Specifications	Output Voltage Accuracy		0% - 100% load	--	±2	--	%
	Line Regulation		Rated load	--	±0.5	--	
	Load Regulation		230VAC	--	±1	--	
	Ripple & Noise*		100MHz bandwidth (peak-to-peak value)	--	--	150	mV
	Stand-by Power Consumption			--	--	0.5	W
	Short Circuit Protection			Hiccup, continuous, self-recovery			
	Over-current Protection			≥110%Io, self-recovery			
	Over-voltage Protection		3.3VDC output	≤5.5V	Output voltage clamp, hiccup		
			5VDC output	≤7.5V			
			9VDC output	≤13.5V			
			12VDC output	≤16V			
			15VDC output	≤21V			
			24VDC output	≤32V			
			27VDC output	≤35V			
			48VDC output	≤60V			
	Minimum Load			0	--	--	%
	Start-up Delay Time			--	--	500	ms
	Hold-up Time		115VAC input, Io=100%	--	28	--	ms
			230VAC input, Io=100%	--	150	--	
General Specifications	Isolation	Input-output	Electric Strength Test for 1min., leakage current <10mA	4000	--	--	VAC
		Input-PE	Electric Strength Test for 1min., leakage current <10mA	2000	--	--	
		Output-PE	Electric Strength Test for 1min., leakage current <20mA	500	--	--	
	Insulation Resistance	Input-output	500VDC	50	--	--	MΩ
		Input-PE					

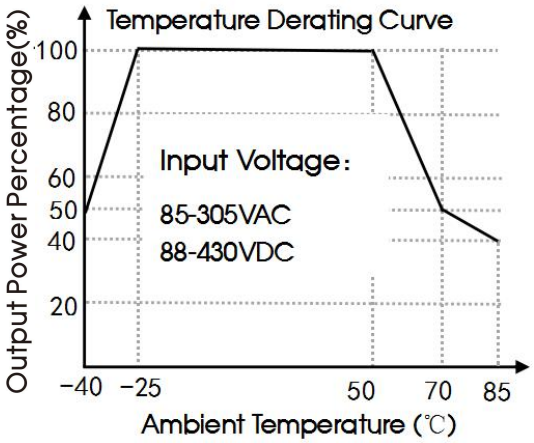
		Output-PE					
General Specifications	Operating Temperature			-40	--	+85	℃
	Storage Temperature			-40	--	+105	
	Altitude			--	--	5000	m
	Switching Frequency			--	65	--	kHz
	Power Derating	-40℃ to -25℃		3.33	--	--	%/℃
		Natural air cooling	+50℃ to +70℃	2.5	--	--	
			+70℃ to +85℃	0.66	--	--	
		Forced cooling wind speed≥ 0.7m/s	+60℃ to +70℃	3	--	--	
			+70℃ to +85℃	1.33	--	--	
		85VAC - 100VAC		1.33	--	--	%/VAC
		277VAC - 305VAC		0.72	--	--	
		2000m-5000m		5	--	--	%/Km
	Safety Class			CLASS I			
	MTBF			MIL-HDBK-217F@25℃ > 300,000 h			
	Designed life	230VAC	+25℃	≥130 x 10^3 h			
			+50℃	≥70 x 10^3 h			
			+70℃	≥44 x 10^3 h			
			+85℃	> 29 x 10^3 h			
Mechanical Specifications	Dimension		132.00 x 50.00 x 27.10 mm				
	Weight		145g (Typ.)				
	Cooling method		Free air convection				

Note: *The "Tip and barrel method" is used for ripple and noise test, with a 0.1uf ceramic capacitor & 100uf parallel capacitor.

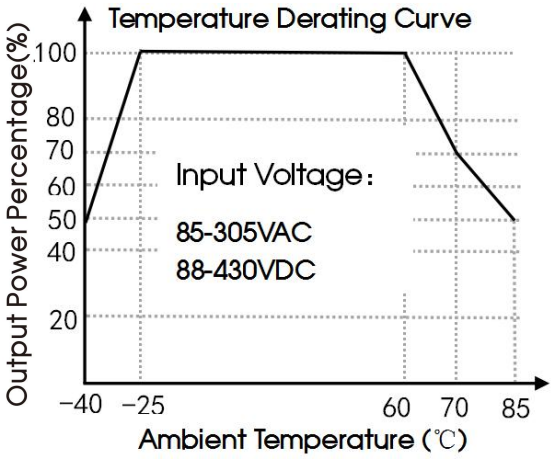
Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions	CE	CISPR32/EN55032 CLASS B	
		RE	CISPR32/EN55032 CLASS A	
	Immunity	ESD	IEC/EN61000-4-2 Contact ±8KV/ Air ±15KV	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 ±2KV/ line to ground ±4KV	Perf. Criteria B
		CS	IEC/EN61000-4-6 10 Vr.m.s	Perf. Criteria A
		Voltage dips, short interruption and voltage variations	IEC/EN61000-4-11 100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods	Perf. Criteria B

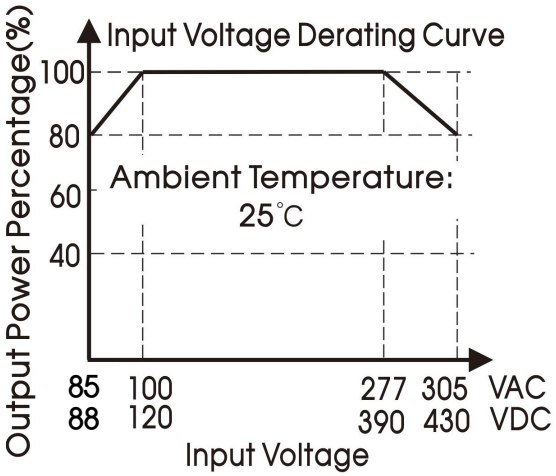
Product Characteristic Curve

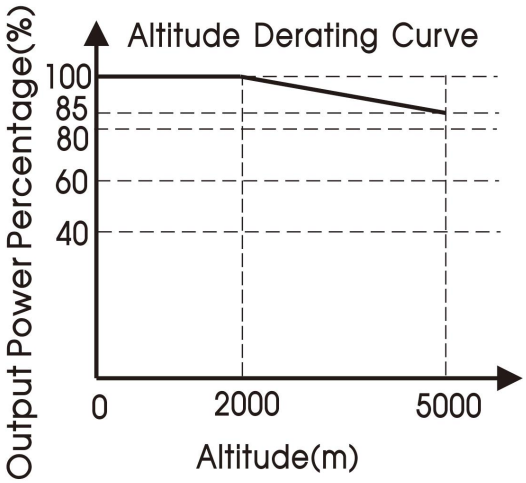


Natural air cooling



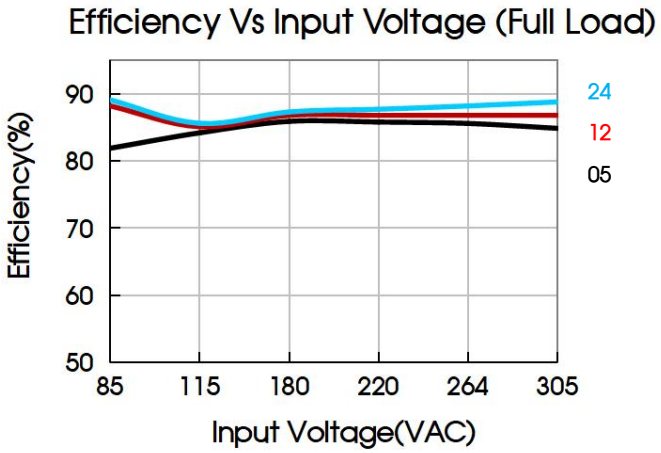
Forced air cooling

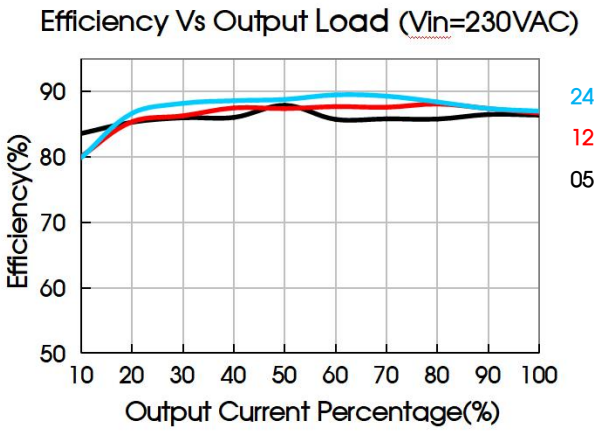




Note: ① With an AC input between 85-100VAC/277-305VAC and a DC input between 88-120VDC/390-430VDC, the output power must be derated as per temperature derating curves;

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





Design Reference

1. Typical application

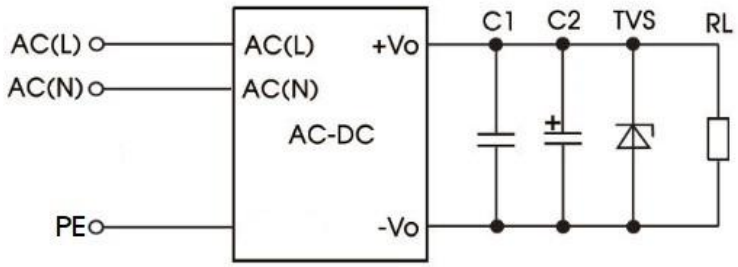


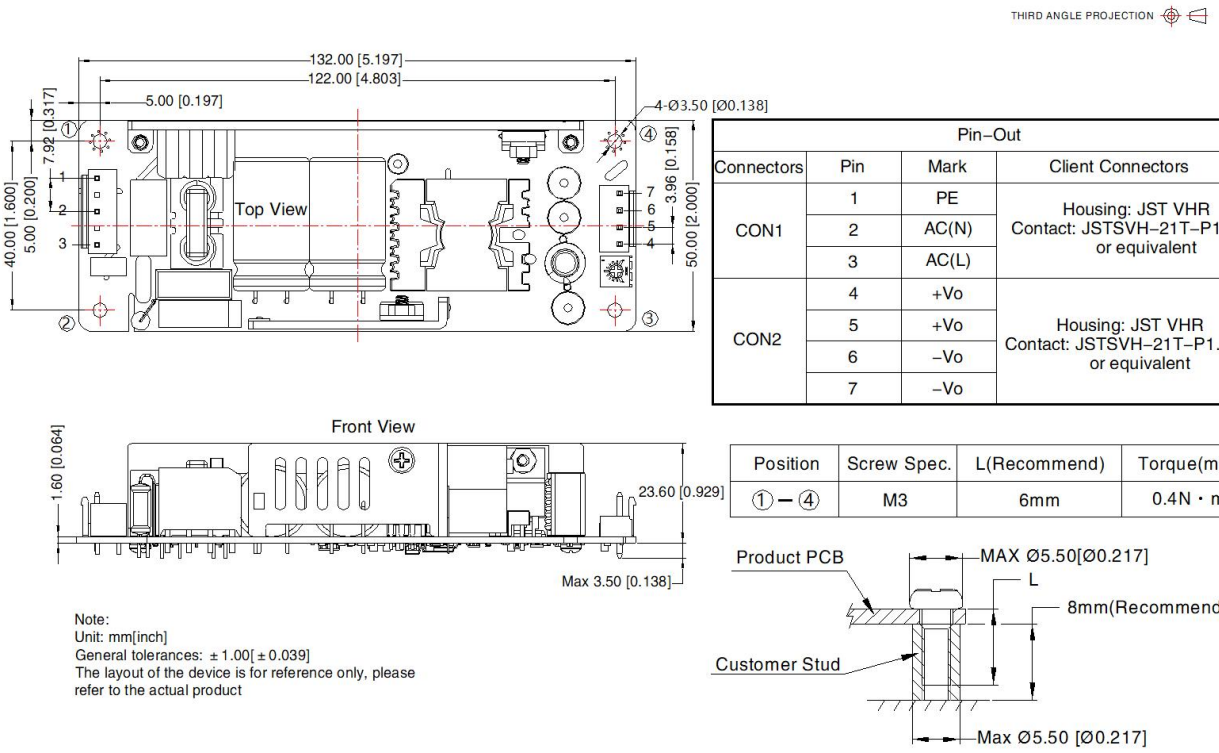
Fig. 1: Typical circuit diagram

Part no.	C1	C2	TVS
AO50-03E	0.1μF/250V	100μF/63V	SMBJ7.0A
AO50-05E			SMBJ7.0A
AO50-09E			SMBJ12A
AO50-12E			SMBJ20A
AO50-15E			SMBJ20A
AO50-24E			SMBJ30A
AO50-27E			SMBJ30A
AO50-48E			SMBJ64A

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 Layout



Pin–Out			
Connectors	Pin	Mark	Client Connectors
CON1	1	PE	Housing: JST VHR Contact: JSTSVH–21T–P1.1 or equivalent
	2	AC(N)	
	3	AC(L)	
CON2	4	+Vo	Housing: JST VHR Contact: JSTSVH–21T–P1.1 or equivalent
	5	+Vo	
	6	–Vo	
	7	–Vo	

Position	Screw Spec.	L(Recommend)	Torque(max)
①–④	M3	6mm	0.4N・m

Note:

1. 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;
2. All index testing methods in this datasheet are based on our company corporate standards;
3. We can provide product customization service, please contact our technicians directly for specific information;
4. Products are related to laws and regulations: see "Features" and "EMC";
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.
6. 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.