ZAO-15-BxxM Series

15W, AC/DC Open Frame Power Supply

DESCRIPTIONS

ZAO-15-BxxM series is one of enclosed AC-DC switching power supply. It features universal AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation. These converters offer excellent EMC performance and design refer toPerf. Criteria A、CLASS B standards and they are widely used in areas of industrial, office and civil applications.

RoHS

CE Report
EN62368-1

FEATURES

- Universal 85-264VAC or 100-370VDC input voltage
- Input withstand 305VAC/5s
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40℃ to +85℃ (-30℃ full load)
- High I/O isolation voltage up to 4000VAC
- Output voltage adjustable
- Output short circuit, over-current, over-voltage protection
- Surge immunity meets Level 4
- Installing in system of Safety Class I is available
- Design refer to UL/IEC62368, EN60335

APPLICATIONS

- Industry
- Handle official business
- Civil

Selection Guide

Certification	Part No.	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range ADJ (V)*	Efficiency at 230VAC (%) Typ.	Capacitive Load (μF) Max.
EN	ZAO-15-B05M	15	5V/3A	4.5-5.5	81	10000
	ZAO-15-B12M	15	12V/1.25A	10.8-13.5	82	2000
	ZAO-15-B15M	15	15V/1A	13.5-16.5	83	1500
	ZAO-15-B24M	15	24V/0.625A	21.6-27	83	500
	ZAO-15-B36M	15.12	36V/0.42A	32.4-39.6	85	300
	ZAO-15-B48M	15.02	48V/0.313A	43.2-52.8	85	300

Note: *The actual adjustment range may extend outside the values stated, care should be exercised to ensure that the output voltage and power levels remain within the published maximum values.

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Specifications

Product characteristics	Item		Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage Range		AC input		85	--	264	VAC
			DC input		100	--	370	VDC
	Input Voltage Frequency				47	--	63	Hz
	Input Current		115VAC		--	--	0.4	A
			230VAC		--	--	0.2	
	Inrush Current		230VAC	Cold start	--	45	--	
	Input Temporary Over-voltage		Rated load output, 305VAC input		5s/time, interval 10s, product without damaging			
	Hot Plug				Unavailable			
Output Specifications	Output Voltage Accuracy		Full load range	5V	--	±2	--	%
				Other output	--	±1	--	
	Line Regulation		Rated load		--	±0.5	--	
	Load Regulation		230VAC	5V	--	±1	--	
				Other output	--	±0.5	--	
	Ripple & Noise*		20MHz bandwidth (peak-to-peak value)	5V	--	50	80	mV
				12V/15V	--	80	100	
				24V	--	100	150	
				36V/48V	--	150	200	
	Stand-by Power Consumption		Room temperature, 230VAC input		--	0.3	0.5	W
	Temperature Coefficient		0℃ to +50℃		--	±0.03	--	%/° C
	Short Circuit Protection				Hiccup, continuous, self-recovery			
	Over-current Protection				115% - 300% Io, self-recover			
	Over-voltage Protection		5V		≤7V	Output voltage clamp or hiccup		
			12V		≤16V			
			15V		≤22V			
			24V		≤33V			
			36V		≤46.8V			
			48V		≤63V			
	Minimum Load				0	--	--	%
	Hold-up Time		115VAC input		--	20	--	ms
			230VAC input		--	100	--	
General Specifications	Isolation	Input - output	Electric Strength Test for 1min., leakage current <5mA		4000	--	--	VAC
		Input - ⏚			2000	--	--	
		Output - ⏚			500	--	--	
	Insulation Resistance	Input - output	Test voltage: 500VDC		100	--	--	MΩ
		Input - ⏚						
		Output - ⏚						
	Operating Temperature				-40	--	+85	° C
	Storage Temperature				-40	--	+85	

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General Specifications	Storage Humidity	Non-condensing		--	--	95	%RH
	Operating Humidity			--	--	90	
	Altitude**			--	--	4000	m
	Output Power Derating	Operating temperature derating	-40℃ to -30℃	6.5	--	--	%/℃
			+50℃ to +70℃	2.5	--	--	
			+70℃ to +85℃	1	--	--	
		Input voltage derating	85VAC - 100VAC	0.67	--	--	
	Leakage Current	240VAC		<0.5mA RMS			
	Safety Class			CLASS I			
	MTBF	MIL-HDBK-217F@25℃		⩾300,000 h			
Mechanical Specifications	Dimension	63.50 x 45.70 x 22.00mm					
	Weight	40g (Typ.)					
	Cooling Method	Air cooling					

Note: *The "Tip and barrel method" is used for ripple and noise test: by using a 12 twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor;
**For operation of altitude between 2000-4000m.

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions	CE	CISPR32/EN55032	CLASS B	
		RE	CISPR32/EN55032	CLASS B	
		Harmonic current	IEC/EN61000-3-2	CLASS A	
	Immunity	ESD	IEC/EN61000-4-2	Contact ±4KV/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/line to PE ±4KV	Perf. Criteria A
		CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A
		PFMF	IEC/EN61000-4-8	30A/m	Perf. Criteria A
		Voltage dips, short interruption and voltage variations	IEC/EN61000-4-11	100% dip 1 periods, 30% dip 25 periods (50Hz), 30 periods (60Hz)	Perf. Criteria B

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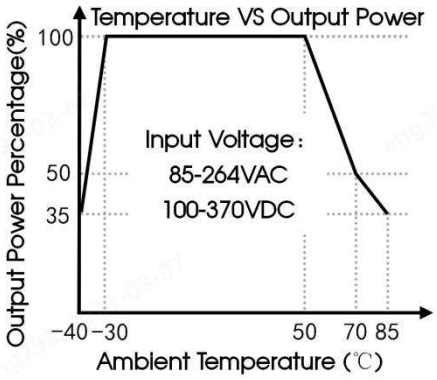
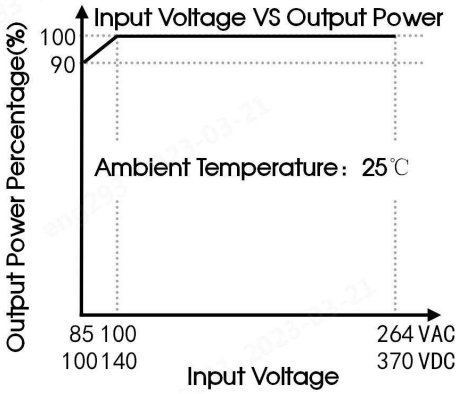
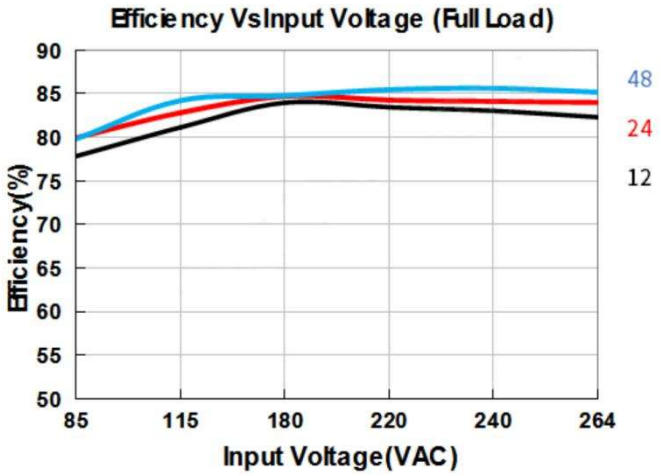
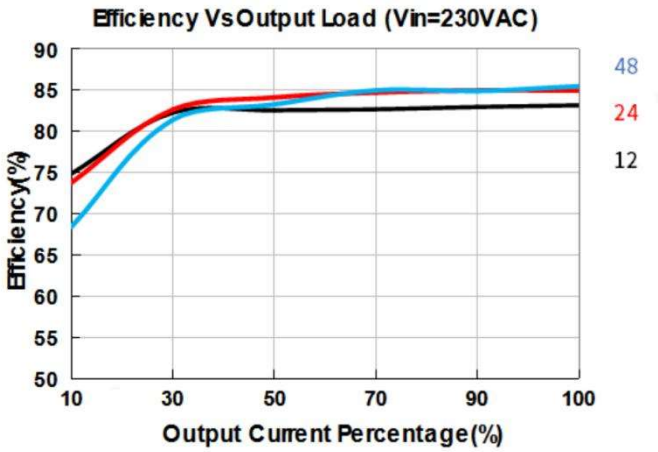
Characteristic Curve





Note: 1.With an AC input voltage between 85-100VAC and a DC input between 100-140VDC the output power must be derated as per the temperature derating curves;
2.This product is suitable for applications using natural air cooling;





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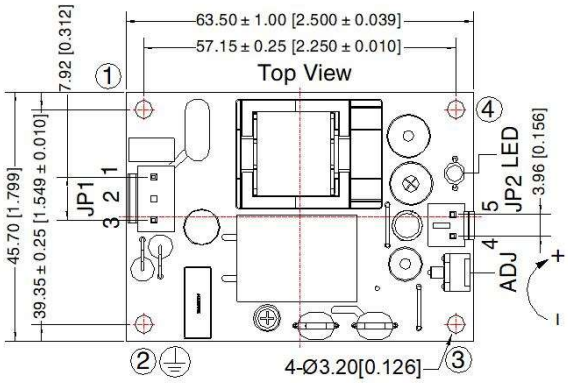
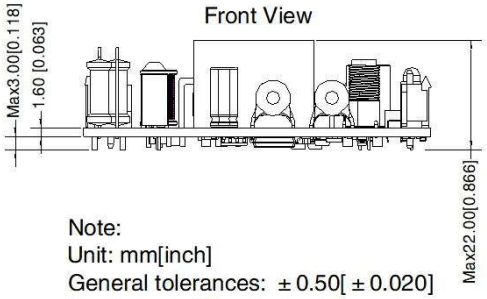
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION

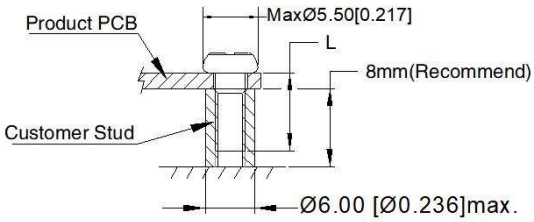


Pin–Out			
Connectors	Pin	Mark	Client Connectors
JP1	1	AC(L)	Housing：JST VHR–3N Contact：JST SVH–21T–P1.1 or equivalent
	2	No Pin	
	3	AC(N)	
JP2	4	–Vo	Housing：JST VHR–2N Contact：JST SVH–21T–P1.1 or equivalent
	5	+Vo	

②must be connected to the earth(⏚)



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



Note:
Unit: mm[inch]
General tolerances: ±0.50[±0.020]
The layout of the device is for reference only,
please refer to the actual product

Note:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity <75% RH with nominal input voltage and rated output load;
2. The room temperature derating of 3.5℃/1000m is needed for operating altitude greater than 2000m;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. The output voltage can be adjusted by the ADJ, clockwise to increase;
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
9. The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.