AOF400-2B-xxV2 Series

DESCRIPTIONS

400W, AC-DC Open Frame Power Supply



RoHS

FEATURES

- Input voltage range:80 - 264VAC/110 - 370VDC
- Compact size: 5” × 3”
- Operating ambient temperature range:-40℃ to +85℃
- Active PFC
- High I/O isolation test voltage up to 4000VAC
- Operating altitude up to 5000m
- Very low leakage current ＜0.1mA
- Stand-by power consumption 0.5W Typ.
- 150% peak load output for 3 second
- The base plate with conformal coating
- Output short circuit, over-current, over-voltage, over-temperature protection
- Design to meet medical approvals and be suitable for BF type applications
- 3 years warranty
- Installing in system of Safety Class I/II is available
- Safety according to IEC/EN/UL62368-1,GB4943.1, IEC/EN60335-1, IEC/EN61558-1, IEC/EN/ES60601-1

APPLICATIONS

- Industrial control
- LED
- Street light control
- Security
- Telecommunications
- Smart home
- Medical

Selection Guide

Certification	Part No.*	Cooling method	Output Power* (W)	Nominal Output Voltage and Current (Vo/Io)	Output adj. Range (V)	Instantaneous Power (W) /Duration (S)	Peak Current (A)	Efficiency at 230VAC (%) Typ.*	Max. Capacitive Load (μF)
--	AOF400-2B-12V2	Air	249.6	12V/20.8A	11.4-12.6	600/3	50	94.0	3000
		23CFM	399.6	12V/33.3A					
	AOF400-2B-24V2	Air	252.0	24V/10.5A	22.8-25.2		25	94.5	1600
		23CFM	400.8	24V/16.7A					
	AOF400-2B-48V2	Air	254.4	48V/5.3A	45.6-50.4		12.5	95.0	1200
		23CFM	403.2	48V/8.4A					

Note:

1.*Under any conditions, the total power of the product should not exceed the rated power. When the output voltage is increased, the total output power cannot exceed the rated output power, when the output voltage is decreased, the output current cannot exceed the rated output current;

2.*When measuring the full load efficiency, the fan should be connected to an external power supply, fan loss is not included in the input power;

3.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	Rated input (Certified voltage)		100	--	240	VAC
		AC input		80	--	264	
		DC input		110	--	370	VDC
	Input Voltage Frequency	Rated input (Certified voltage)		50	--	60	Hz
		AC input		47	--	63	
	Input Current	Rated input (Certified voltage)		--	--	5.0	A
		115VAC		--	--	5.0	
		230VAC		--	--	2.5	
	Inrush Current	115VAC	Cold start	--	40	--	
		230VAC		--	80	--	
	Power Factor	115VAC		--	0.98	--	--
		230VAC		--	0.95	--	
	Input Fuse	Built-in fuse		--	8	--	A
	Hot Plug			Unavailable			
Output Specifications	Output Voltage Accuracy*	Full load range		--	±3.0	--	%
	Line Regulation	Rated load		--	±0.5	--	
	Load Regulation	0% - 100% load		--	±1.0	--	
	Minimum Load			0	--	--	
	Stand-by Power Consumption	At room temperature, 230VAC input (when PS_ON is at high potential) Vdd voltage: 3.3-15V, Vdd supply current requirement: 5mA.When PS_ON is at a high		--	--	0.5	W

	level to SGND, the power output is turned off						
Ripple & Noise*	20MHz bandwidth (peak-peak value)	12V	--	--	120	mV
		24V	--	--	200	
		48V	--	--	250	
Temperature Coefficient			--	±0.03	--	%/℃
Hold-up Time	230VAC, rated load, 25℃	Air cooling（250W Load）	--	30	--	ms
		23CFM（400W Load）	--	16	--	
Short Circuit Protection	Recovery time <3s after the short circuit disappear.		Hiccup, continuous, self-recover			
Over-current Protection	100-240VAC, rated load	Normal temperature, high temperature	≥105% Io, hiccup, self-recover			
		Low temperature	≥105% full load after derating, hiccup, self-recover			
Over-voltage Protection	12V		≤16.0VDC (Hiccup, self-recover)			
	24V		≤33VDC (Hiccup, self-recover)			
	48V		≤60VDC (Hiccup, self-recover)			
Over-temperature Protection*	115VAC, 100% load Recommended external wind environment: 23CFM	Over-temperature protection start	65	--	90	℃
		Over-temperature protection release	50	--	75	
Fan power	12V		Provide 12V/0.5A output for the fan, with voltage accuracy of ±15% under the premise that the main output is greater than 20% of the rated load			
PS_ON Input Signal*	External power supply	Vdd voltage	3.3	--	15	V
	Power on	PS_ON high	0	--	0.6	
	Power off	PS_ON low	3.3	--	24	
PG Signal	High level	High	2	--	5	
	Low level	Low	0	--	1	
	Power on	The PG signal goes high with 10ms to 500ms delay after power set up	10	--	500	ms
	Power off/Power fail	The TTL signal goes low at least 1ms before output below 90% of rated value	1	--	--	
Remote compensation	The total compensation voltage value when Vs+ and Vs- (pins S1 and S2 of CN2) are respectively		--	--	0.5	V

		short-circuited to the output load terminals (RS+ short-circuited to +Vo, RS- short-circuited to -VO)						
	LED Signal	Main output status indication	Normal output		Green on			
			Power off (AC without Input)		Light off			
	Remote Sense				When RS+ and RS- are connected to the system, with function of remote voltage compensation, if not needed, left RS+ and RS- open			
General Specifications	Isolation Test	Input - output	Electric strength test for 1min., leakage current <5mA		4000	--	--	VAC
		Input - ⏚			2000	--	--	
		Output - ⏚			1500	--	--	
	Insulation Resistance	Input - ⏚	Ambient temperature: 25 ± 5℃ Relative humidity: < 95%RH, no condensation Test voltage: 500VDC		100	--	--	MΩ
		Input - output			100	--	--	
		Output - ⏚			100	--	--	
	Isolation level	Input - output			2xMOPP			
		Input - ⏚			1xMOPP			
		Output - ⏚			1xMOPP			
	Operating Temperature				-40	--	85	℃
	Storage Temperature				-40	--	85	
	Storage Humidity	No condensation			10	--	95	%RH
	Operating Humidity				20	--	90	
	Power Derating	Operating temperature derating	23CFM rated power 400W	-40℃ to +50℃	0	--	--	%/℃
				+50℃ to +70℃	1.87	--	--	
			Air cooling rated power 250W	+70℃ to +85℃	3.0	--	--	
			230VAC	-40℃ to +45℃	0	--	--	
				+45℃ to +60℃	1.5	--	--	
			115VAC	+60℃ to +70℃	1.0	--	--	
				-40℃ to +40℃	0	--	--	
				+40℃ to +70℃	1.42	--	--	
		Input voltage derating	80VAC-115VAC		1.142	--	--	%/VAC
			115VAC-264VAC		0	--	--	
	Leakage Current	240VAC, 60Hz	Touch current		< 0.1mA			
			Earth leakage current		< 0.5mA			

	Safety Class		CLASS I (with PE and must be connected)/ CLASS II (without PE)
	MTBF	MIL-HDBK-217F@25℃	≥200,000 h
	Warranty	Ambient temperature: <25℃	3 years
Mechanical Specifications	Case Material	Open frame	
	Dimension	127.00mm × 76.20mm × 27.50mm	
	Weight	410g (Typ.)	
	Cooling Method*	Air cooling (250W) / 23CFM (400W)	

Notes: 1. * Output Voltage Accuracy: including setting error, line regulation, load regulation.

2.* The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor,

3.*Over-temperature protection mode: Intermittent operation, self-rese

4..*When PS-ON is suspended, output remains normal, PS-ON high-level standby.

Environmental Characteristics

Item	Operating Conditions	Standard
High and Low Temperature Working	+85℃, -40℃	GB2423.1, IEC60068-2-1
Sinusoidal Vibration	10 - 500Hz, 2g, three directions of X, Y, Z axis	GB2423.10, IEC60068-2-6
Alternating Hot and Humid	+25℃, 95%RH - +60℃, 95%RH	GB2423.4, IEC60068-2-30
Low Temperature Storage	-40℃	GB2423.1, IEC60068-2-1
High Temperature Storage	+85℃	GB2423.2, IEC60068-2-2
High Temperature Aging	+50℃ (23CFM, Full load)	GB2423.2, IEC60068-2-2
Normal Temperature Aging	+25℃ (23CFM, Full load)	GB2423.1, IEC60068-2-1
Temperature Shock	-40℃ to +85℃	GB2423.22, IEC60068-2-14
Temperature Cycle	-25℃ to +50℃	GB2423.22, IEC60068-2-14
Hot and Humid	+85℃, 85%RH	GB2423.50, IEC60068-2-67
High Temperature Elevation	+60℃, 54KPa	GB2423.26, IEC60068-2-41
Low Temperature Elevation	-25℃, 54KPa	GB2423.25, IEC60068-2-40
Constant Humid and Hot	+40℃, 95%RH	GB2423.3, IEC60068-2-78
Sinusoidal Vibration Response	10 - 150Hz, 1g, three directions of X, Y, Z axis	GB/T 11287-2000, IEC60255-21-1
Sinusoidal Vibration Endurance Test		
Sinusoidal Impulse Response	15g, pulse duration 11ms, three times in each direction of X, Y, Z axis	GB/T 114537-1993, IEC60255-21-2
Packaging Drop	1m, one corner, three edges and six sides	GB2423.8, IEC68-2-32

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 (CLASS I equipment, CLASS B; CLASS II equipment, CLASS A)	
		RE	CISPR32/EN55032 (CLASS I equipment, CLASS B; CLASS II equipment, CLASS A)	
		Harmonic current	IEC/EN61000-3-2 CLASS A and CLASS D	
	Immunity (EMS)	ESD	IEC/EN 61000-4-2 Contact ±8KV/Air ±15KV	perf. Criteria A
		RS	IEC/EN 61000-4-3 10V/m	perf. Criteria A
		EFT	IEC/EN 61000-4-4 ±2KV	perf. Criteria A

		Surge	IEC/EN 61000-4-5 ±2KV/±4KV	perf. Criteria A
		CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
		Voltage drop	IEC/EN61000-4-11 70% 240 ,25/30 Period(50/60Hz) 40% 240 ,10/12 Period(50/60Hz) 0% 240 ,1 Period (Un is the maximum input nominal voltage)	perf. Criteria B
		Voltage interruption	IEC/EN61000-4-11 0% 240 ,250/300 periods (50/60Hz) (Un is the maximum input nominal voltage)	perf. Criteria C
		Power frequency magnetic field immunity	IEC/EN61000-4-8 30A/m	perf. Criteria A

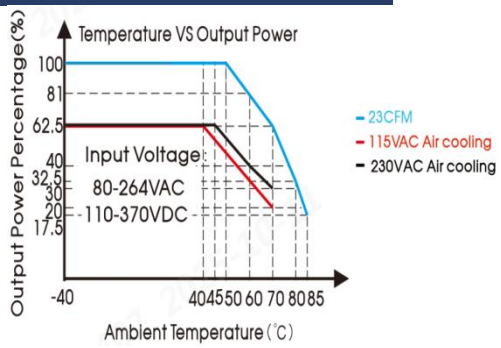
Notes: 1.*The power supply is considerated a component as part of system, all EMC items are tested on a metal plate (L x W x H, 360mm x 360mm x 1mm). Power supply should be combined with final equipment for EMC confirmation;
2.*Category I products with PE, which must be connected, category II products without PE.
3.*perf. Criteria:

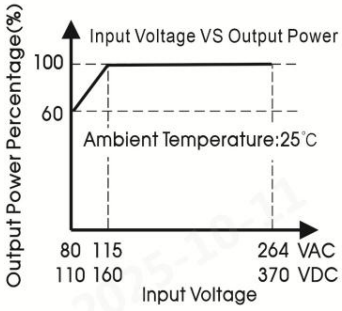
A: The equipment shall continue to operate as intended without operator intervention;

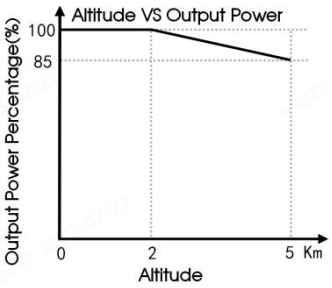
B: After the test, the equipment shall continue to operate as intended without operator intervention;

C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Characteristic Curve

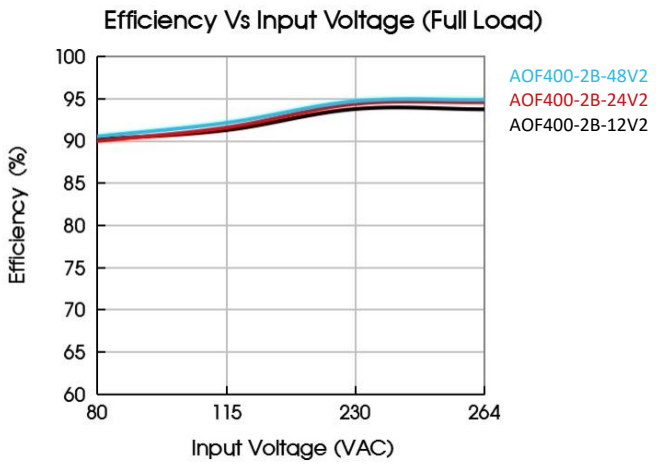


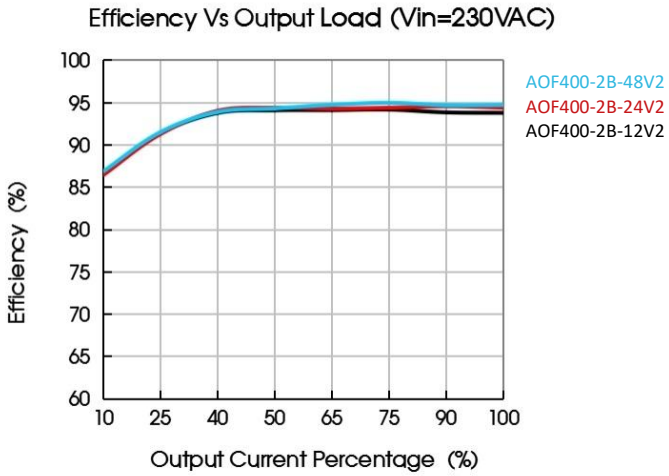




Note: 1. With an AC input voltage between 80 -115VAC and a DC input between 110-160VDC the output power must be derated as per the temperature derating curves.

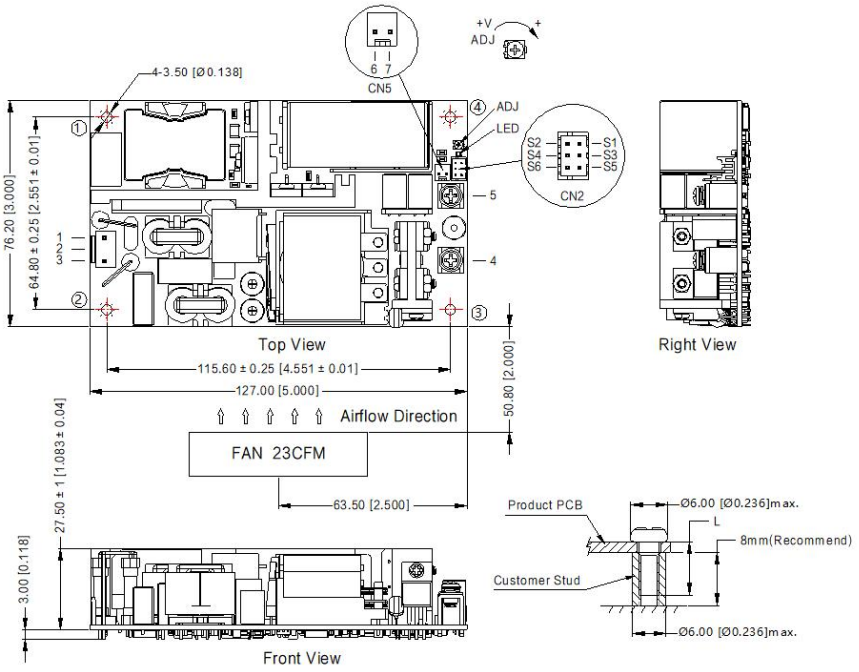
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consul FAE.





Dimensions and Recommended

THIRD ANGLE PROJECTION

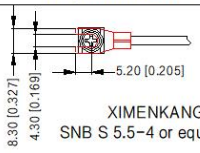


Pin-Out		Customer Connector
Pin	Mark	
1	AC(N)	Housing: JST VHR-3 or equivalent
2	NC	Terminal: JST SVH-21T-P1.1 or equivalent
3	AC(L)	
4	+Vo	
5	-Vo	
6	FAN-	CN5: Fan power output port Housing: Molex 0511910200 or equivalent
7	FAN+	Terminal: Molex 0508028100 or equivalent



CN2

Pin-Out		Customer Connector
Pin	Mark	
S1	RS-	Housing: CJT A2006H-2x3P or equivalent Terminal: CJT A2006-T or equivalent
S2	RS+	
S3	SGND	
S4	PG	
S5	PS_ON	
S6	Vdd	

Pro. No	Output connector	Output connector Pic.
12V, 24V, 48V	10AWG	
Screw/torque	M4.0, 0.9N · m ± 10%	XIMENKANG SNB S 5.5-4 or equivalent

Position	Screw Spec.	L(Recommend)	Torque
①－④	M3	6mm	0.6N · m ± 10%

Note:
1. Unit: mm[inch]
2. ADJ: Output adjustable resistor
3. General tolerances: ± 1.00[± 0.039]
4. Do not use fan power to power other devices
5. The layout of the device is for reference only, please refer to the actual product
6. Reserved safety distance between PCB edge and customer components, recommended 10mm
7. Class Ⅰ system ①, ②, ④ positions must be connected to the earth(⏚)
8. Class Ⅱ system ①, ②, ④ positions must be connected together

CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.
ATTENTION. Double pôle/fusible sur le neutre. Débrancher l'alimentation avant l'entretien.

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. All index testing methods in this datasheet are based on our company corporate standards;
3. 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;
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 output voltage can be adjusted by the ADJ, clockwise to increase;
8. 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.
9. When the output voltage is adjusted via the ADJ exceeds the upper adjustable limit specified in the manual, the product may trigger over-power protection. It will automatically recover after being adjusted back within the specified range.
10. The surface of product should keep a safe distance from the customer system (recommended ≥3mm), if not, please consult FAE.