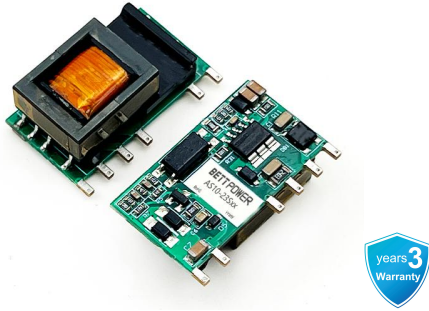


# AS10-23Sxx Series

AC-DC Converter | 10W | Small open frame | SIP | 4000VAC | 85~305VAC



## Features

- 1.3"x0.8" compact size, high power density
- Universal Input:85~305VAC / 100~430VDC
- No-load power consumption: 0.1W
- Operating temperature range:-40℃ ~ +85℃
- Isolation voltage: 4000VAC
- High efficiency: up to 84%(typ.)
- Multi application, flexible layout, green power
- Output short circuit, over current and over voltage protection
- Designed to meet UL/IEC/BS EN/EN62368, EN60335, IEC/EN61558

## Product description



AS10-23Sxx series is highly efficient green power AC-DC open frame power module. It features a compact design and supports universal input voltage range of 85~305Vac, high reliability, low power consumption and reinforced insulation. These power supply modules are particularly suitable for applications with strict space constraints, such as industrial control, electric power, instrumentation and smart home applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

## Selection Guide

Certification	Part No.	Input Voltage (VAC)	Output Power (W)	Output Voltage (VDC)	Output Current Max.(mA)	Full Load Efficiency % (230VAC,typ.)	Capacitive Load Max.(μF)
EN/UL pending	AS10-23S03	85~305	6.6	3.3	2000	74	1500
	AS10-23S05	85~305	10	5	2000	78	1500
	AS10-23S09	85~305	10	9	1100	79	1000
	AS10-23S12	85~305	10	12	840	83	680
	AS10-23S15	85~305	10	15	670	83	470
	AS10-23S24	85~305	10	24	420	84	330

Note: 1. The above data were all tested within the parameter range of typical application circuits.

2. If the product is used in a high-vibration environment, it is necessary to apply glue to fix it.

3. Products with the suffix "-P" are models without conformal coating protection on the surface, such as AS10-23S05-P.

4. Products with the suffix "-F" are horizontal type with 90° bent pin products, such as AS10-23S05-F.

5. The product images are for reference only. Please refer to the actual product for details.

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	VAC
	DC input	100	--	430	VDC
Input Current	115VAC	--	--	0.40	A
	230VAC	--	--	0.25	A
Impulse current	115VAC	--	18	--	A
	230VAC	--	35	--	A
Input Frequency		47	--	63	Hz
Recommended External Input Fuse		1A/300V,slow-blow, required			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy	3.3V Output	--	±3	--	%	
	Other output	--	±2	--	%	
Line Regulation	Rated load	--	±0.5	--	%	
Load Regulation	10% ~- 100% load	3.3 VDC output	--	±2.0	--	%
		5 VDC output	--	±1.5	--	%
		Other voltage	--	±1.0	--	%
Ripple & Noise	20MHz bandwidth (peak-to-peak value),10% ~ 100% load	--	80	150	mV	
Temperature Coefficient		--	±0.15	--	%/°C	
Stand-by Power Consumption	230VAC	--	0.1	0.25	W	
Min. Load		0	--	--	%	
Over-current Protection		110	--	--	%Io	
Short Circuit Protection		Continuous, Self-Recovery				

Note: Ripple & noise are measured at 20MHz of bandwidth with a 10uF electrolytic capacitor and a 1uF ceramic capacitor connected inparallel at the output.

## General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, test time 1 minute, leakage current less than 5mA	4000	--	--	VAC
Insulation Resistance	Input-output, insulated voltage 500VDC	50	--	--	MΩ
Power Derating	-40°C - -25°C	1	--	--	%°C
	+55°C - +85°C	2.5	--	--	%°C
	85VAC - 100VAC	1	--	--	%/VAC

	277VAC - 305VAC	0.535	--	--	%/VAC
Operating Temperature		-40	--	85	°C
Storage Temperature		-50	--	105	°C
Soldering Profile	Wave soldering	260 ± 5°C. time: 5 - 10s			
	Manual welding	360 ± 10°C. time: 3 - 5s			
Safety Standard	Product design conforms to IEC/EN/BS EN62368-1, IEC/EN61558-1/-2-16, EN60335-1, UL62368-1				
Safety Class	CLASS II				
MTBF	MIL-HDBK-217F@25°C	>300,000h			

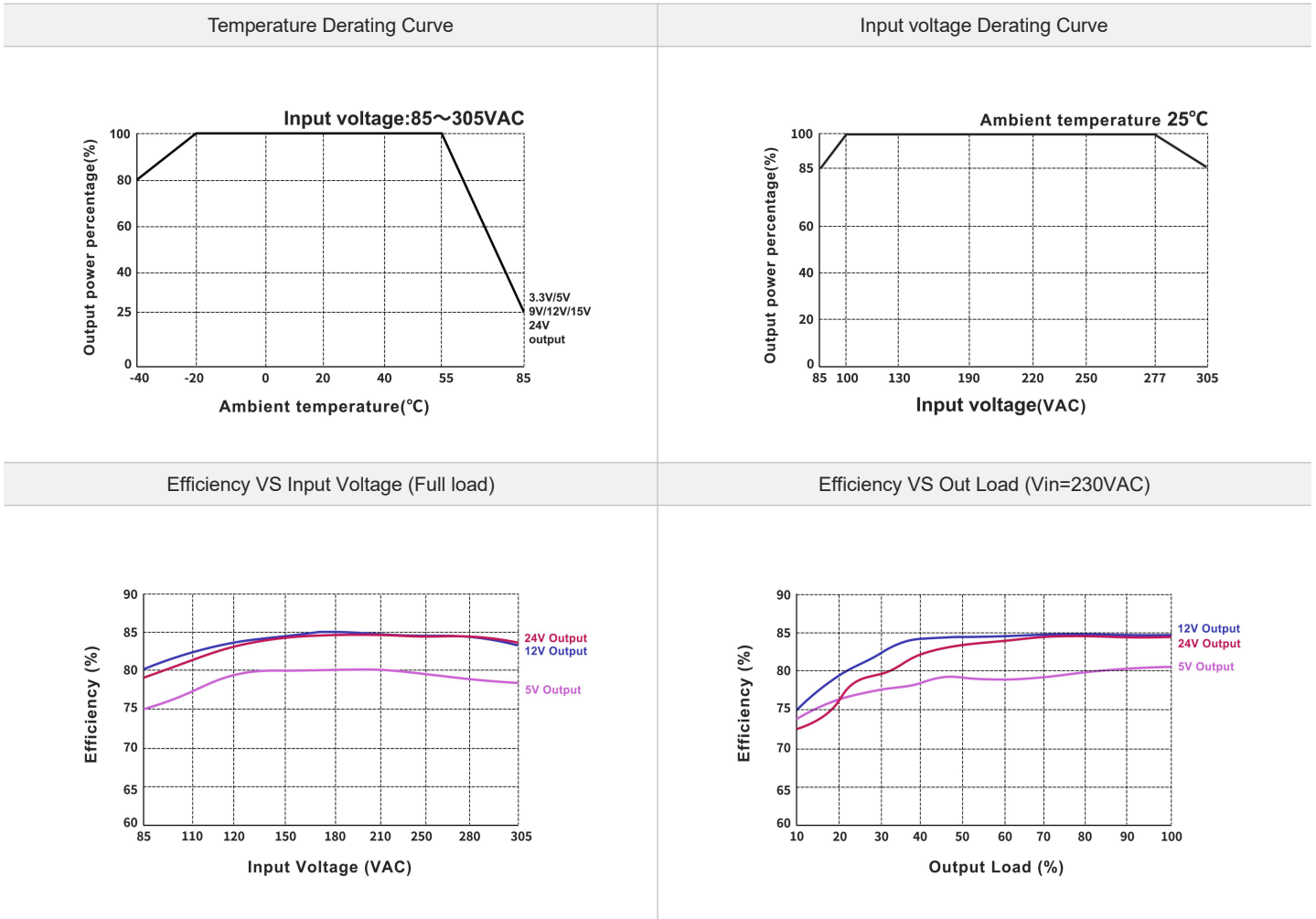
## Mechanical Specifications

Package Dimensions	32.00 * 14.50 * 20.00mm				
Weight	AS10-23Sxx(-P)	10.2g(Typ.)			
	AS10-23Sxx-F	11.3g(Typ.)			
Cooling Method	Free air convection				

## Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS A (EMC Solutions - Recommended Circuits 1,4)			
		CISPR32/EN55032 CLASS B (EMC Solutions - Recommended Circuits 2,3)			
	RE	CISPR32/EN55032 CLASS A (EMC Solutions - Recommended Circuits 1,4)			
		CISPR32/EN55032 CLASS B (EMC Solutions - Recommended Circuits 2,3)			
EMS	RS	IEC/EN61000-4-3 10V/m			perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (EMC Solutions - Recommended Circuits 1,2)			perf. Criteria B
		IEC/EN61000-4-4 ±4KV (EMC Solutions - Recommended Circuits 3,4)			perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±1KV (EMC Solutions - Recommended Circuits 1,2)			perf. Criteria B
		IEC/EN61000-4-5 line to line ±2KV (EMC Solutions - Recommended Circuits 3,4)			perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s			perf. Criteria A
ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV			perf. Criteria B	

Product Characteristic Curve

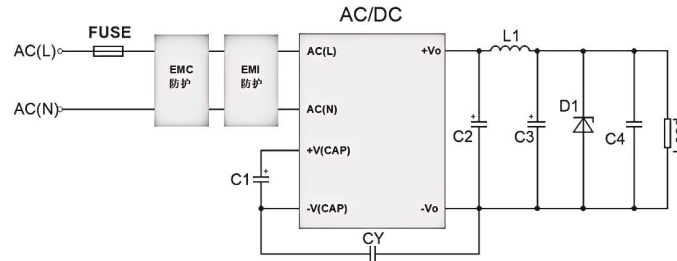


Note:

1. For input voltages of 85-100VAC/277-305VAC, voltage derating should be carried out on the basis of temperature derating.
2. This product is suitable for use in a natural wind-cooled environment.

## Design Reference - Application circuit

Application circuit



Reference Table for Selection of Peripheral Devices

Part No.	C1(required)	C2(required)	L1(required)	C3(required)	C4	CY(required)	D1
AS10-23S03	22uF/450V	820uF/16V	2.2uH 6.5A 15mΩMAX	150uF/25V	0.1uF/50V	1nF/400VAC	See note
AS10-23S05	22uF/450V	(solid-state capacitor)		150uF/25V	0.1uF/50V	1nF/400VAC	
AS10-23S09	22uF/450V	470uF/25V		150uF/25V	0.1uF/50V	1nF/400VAC	
AS10-23S12	22uF/450V	(solid-state capacitor)	150uF/25V	0.1uF/50V	1nF/400VAC		
AS10-23S15	22uF/450V	470uF/35V	3.3uH 5A	100uF/35V	0.1uF/50V	1nF/400VAC	
AS10-23S24	22uF/450V		25mΩMAX	100uF/35V	0.1uF/50V	1nF/400VAC	

- Note:
- FUSE, EMC protection, and EMI protection are selected according to actual application requirements.
  - C1 is used as filter capacitor with AC input (must be connected externally) and as EMC filtering electrolytic capacitor with DC input (must be connected), and it is recommended to use the capacitor with ripple current >400mA@100KHz.
  - C2, C4, and L1 form a Pi type filtering circuit, and it is recommended to use high-frequency and low resistance electrolytic capacitors or solid-state capacitors. When selecting L1, ripple requirements can be considered, while paying attention to current and internal resistance values.
  - D1 is a TVS transistor that can protect the downstream circuit in case of module abnormalities. It is recommended to choose a model that is 1.2 times the output voltage.

## Design Reference - EMC Solutions - Environmental Application

Environmental application EMC solution selection table

Recommended circuit	Application environmental	Typical industry	Input voltage range	Environment temperature	Emissions	Immunity
1	Basic application	None	85~305VAC	-40℃ ~ +85℃	Class A	Level 3
2	Indoor civil environment	Smart home/Home appliances		-25℃ ~ +55℃	Class B	Level 3
3	Indoor general environment	Intelligent building/Intelligent agriculture		-25℃ ~ +55℃	Class B	Level 3
4	Indoor industrial environment	Manufacturing workshop		-25℃ ~ +55℃	Class B	Level 4
5	Outdoor general environment	ITS/Video monitoring/Charging point/Communication/Security and protection		-40℃ ~ +85℃	Class A	Level 4

Immunity design circuits for reference		Emissions design circuits for reference	
Level 3	Level 4	Class A	Class B

## Design Reference - EMC Solutions - Recommended Circuits

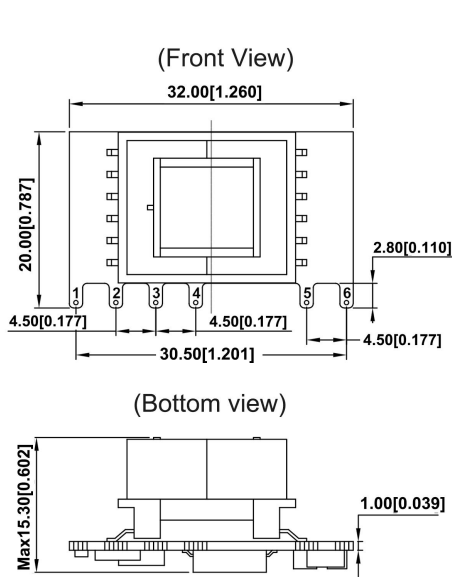
EMC Solutions - Recommended Circuits 1	EMC Solutions - Recommended Circuits 2
EMC Solutions - Recommended Circuits 3	EMC Solutions - Recommended Circuits 4

Recommended parameter values for EMC solution circuits

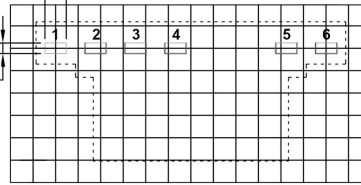
Model	Circuit 1	Circuit 2	Circuit 3	Circuit 4
FUSE	1A/300V, Slow-blow, Required		2A/300V, Slow-blow, Required	
R1	6.8Ω/3W (Wire-wound resistor, Required)			
MOV	14D561			
LDM1	2.2mH/Max: 4Ω/Min:0.24A			
LCM1	200uH 0.8A			
LCM2	12.6mH/MIN 0.5A			
Cx1,Cx2	0.1uF/310VAC			
CY1,CY2,,CY3	1nF/400VAC			

## Dimensions and Recommended Layout

### AS10-23Sxx(-P) Dimensions and Recommended Layout



Third Angle Projection

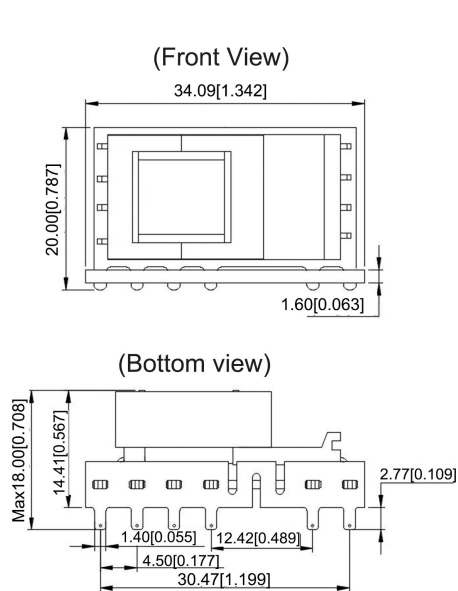


The grid distance size is 2.54mm\*2.54mm

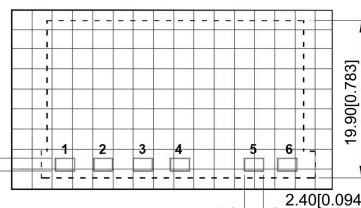
Pin	Function
1	AC(L)
2	AC(N)
3	+V(CAP)
4	-V(CAP)
5	-Vo
6	+Vo

Note:  
 Size unit: mm [inch]  
 Pin diameter tolerance:  $\pm 0.10$  [ $\pm 0.004$ ]  
 Unmarked dimensional tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]

### AS10-23Sxx-F Dimensions and Recommended Layout



Third Angle Projection



The grid distance size is 2.54mm\*2.54mm

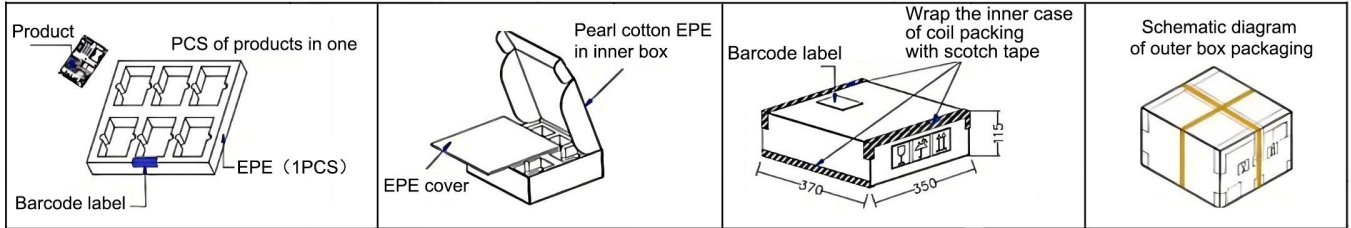
Pin	Function
1	AC(L)
2	AC(N)
3	+V(CAP)
4	-V(CAP)
5	-Vo
6	+Vo

Note:  
 Size unit: mm [inch]  
 Pin diameter tolerance:  $\pm 0.10$  [ $\pm 0.004$ ]  
 Unmarked dimensional tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]

## Packaging Information

Model series	Product quantity(pcs/tray)	Inner carton quantity(pcs/carton)	Outer carton quantity(pcs/carton)
AS10-23Sxx(-P)	108	324	648
AS10-23Sxx-F	114	342	684

The schematic diagram of pearl cotton packaging is shown below:



## Product precautions

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage.
  2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product.
  3. The maximum capacitive load is tested within the input voltage range and under full load conditions.
  4. Unless otherwise specified, all indicators in this manual are measured at  $T_a=25\text{ }^\circ\text{C}$ , humidity<75% RH, nominal input voltage, and output rated load.
  5. All indicator testing methods in this manual are based on our company's corporate standards.
  6. Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel.
- Product specifications are subject to change without prior notice.

## Manufacturer contact information

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