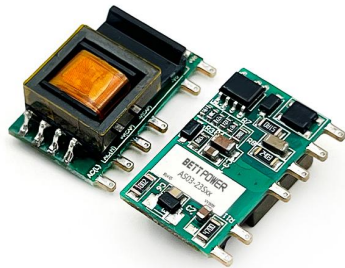


AS03-23Sxx Series

AC-DC Converter | 3W | Small open frame | SIP | 4000VAC | 85~305VAC



Features

- 1"x0.6" compact size, high power density
- Universal Input: 85~305VAC / 100~430VDC
- No-load power consumption: 0.1W
- Operating temperature range: -40°C ~ +85°C
- Isolation voltage: 4000VAC
- High efficiency: up to 81%(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



AS03-23Sxx 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	AS03-23S03	85~305	1.98	3.3	600	68	820
	AS03-23S05	85~305	3	5	600	73	680
	AS03-23S09	85~305	3	9	340	77	470
	AS03-23S12	85~305	3	12	250	77	470
	AS03-23S15	85~305	3	15	200	78	330
	AS03-23S18	85~305	3	18	167	81	220
	AS03-23S24	85~305	3	24	125	80	220

- 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 its body.
 3. Products with the suffix "-P" are models without conformal coating protection on the surface, such as AS03-23S05-P.
 4. Products with the suffix "-F" are horizontal type with 90° bent pin products, such as AS03-23S05-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	--	--	0.15	A
	230VAC	--	--	0.07	A
Input Frequency		47	--	63	Hz
Recommended External Input Fuse		1A, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy	10% ~- 100% load	--	±5	--	%	
Line Regulation	Rated load	3.3V output	--	±2.5	--	%
		others	--	±1.5	--	%
Load Regulation	10% ~- 100% load	--	±3.0	--	%	
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	--	W	
Min. Load		10	--	--	%	
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 in parallel 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
Power Derating	+55°C ~ +85°C	2.5	--	--	%/°C
	85VAC ~ 100VAC	1	--	--	%/VAC
	277VAC ~ 305VAC	0.535	--	--	%/VAC
Operating Temperature		-40	--	85	°C
Storage Temperature		-40	--	105	°C
Soldering Profile	Wave soldering	260 ± 5°C. time: 5 - 10s			
	Manual soldering	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	>1000Kh

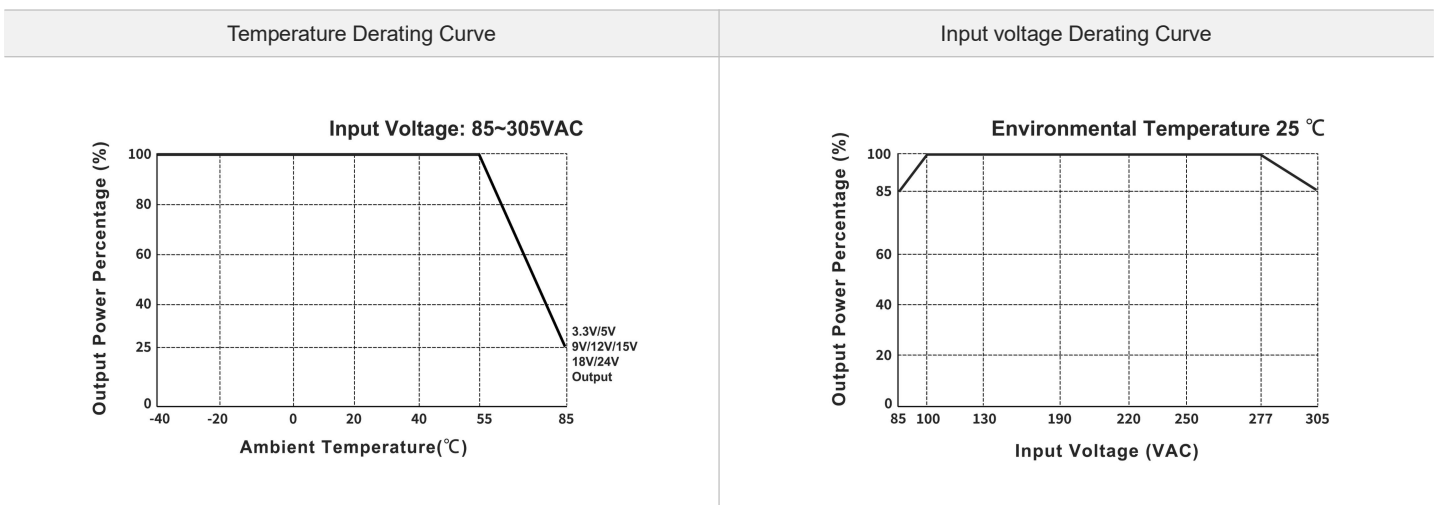
Mechanical Specifications

Package Dimensions	26.40 * 11.00 * 17.60mm	
Weight	AS03-23Sxx(-P)	5.01g(typ.)
	AS03-23Sxx-F	5.56g(typ.)
Cooling Method	Free air convection	

Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS A (Recommended Circuits 1)	
		CISPR32/EN55032 CLASS B (Recommended Circuits 2)	
	RE	CISPR32/EN55032 CLASS A (Recommended Circuits 1)	
		CISPR32/EN55032 CLASS B (Recommended Circuits 2)	
EMS	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (Recommended Circuits 1)	perf. Criteria B
		IEC/EN61000-4-4 ±4KV (Recommended Circuits 2)	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±1KV (Recommended Circuits 1)	perf. Criteria B
		IEC/EN61000-4-5 line to line ±2KV (Recommended Circuits 2)	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

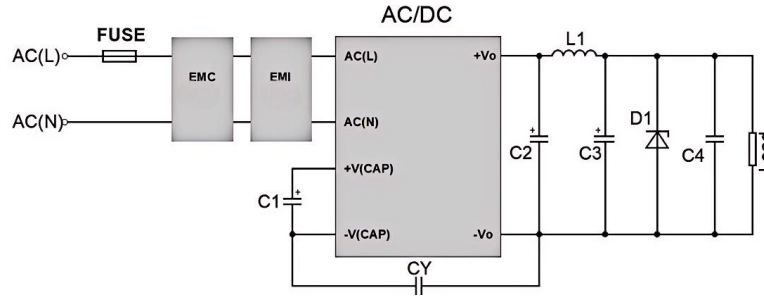


Note:

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

Typical Application circuit 1



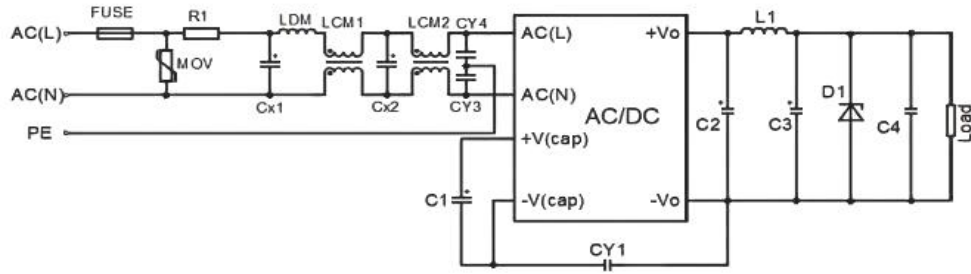
Recommended parameter values

Part No.	C1(required)	C2(required)	L1(required)	C3(required)	C4	CY(required)	D1
AS03-23S03	10uF/450V	470uF/10V (solid-state capacitor)	2.2uH 3A 15mΩMAX	150uF/16V	0.1uF/50V	1nF/400VAC	See Note
AS03-23S05				150uF/16V	0.1uF/50V	1nF/400VAC	
AS03-23S09				150uF/25V	0.1uF/50V	1nF/400VAC	
AS03-23S12		470uF/35V	3.3uH 3A 25mΩMAX	150uF/25V	0.1uF/50V	1nF/400VAC	
AS03-23S15				100uF/35V	0.1uF/50V	1nF/400VAC	
AS03-23S24				100uF/35V	0.1uF/50V	1nF/400VAC	

- Note:
1. FUSE, EMC protection, and EMI protection are selected according to actual application requirements.
 2. 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.
 3. 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.
 4. 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 - Recommended Circuits

EMC Solutions Recommended Circuits 2

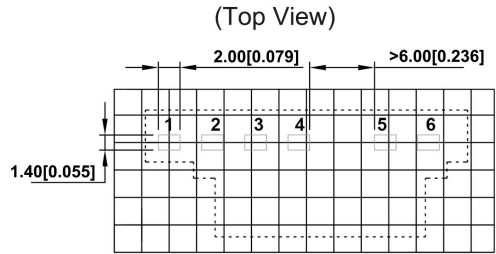
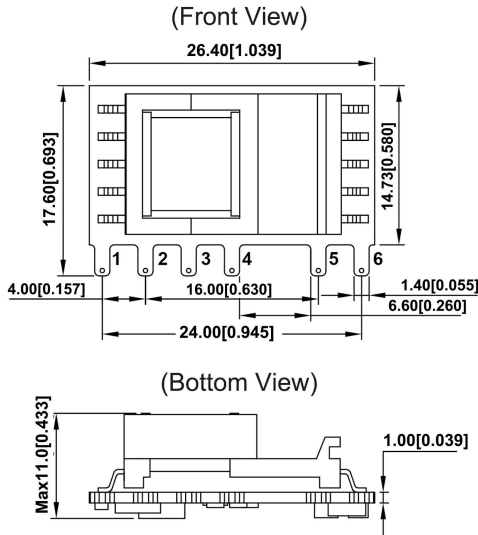


Model	Recommended parameter values
FUSE	2A/300V, Slow-blow, Required
R1	12Ω/3W (Wire-wound resistor, Required)
MOV	14D561
LDM	2.2mH/Max: 4Ω/Min: 0.24A
LCM1	200uH 0.8A
LCM2	12.6mH/MIN 0.5A
CX1,CX2	0.1uF/310VAC
CY1,CY3,CY4	1nF/400VAC
Other	Refer to typical circuit design and application

Dimensions and Recommended Layout

AS03-23Sxx(-P) Dimensions and Recommended Layout

Third Angle Projection



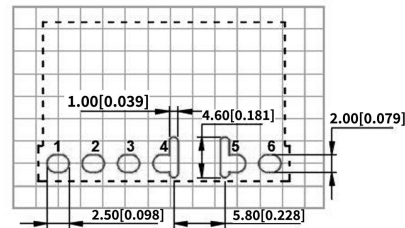
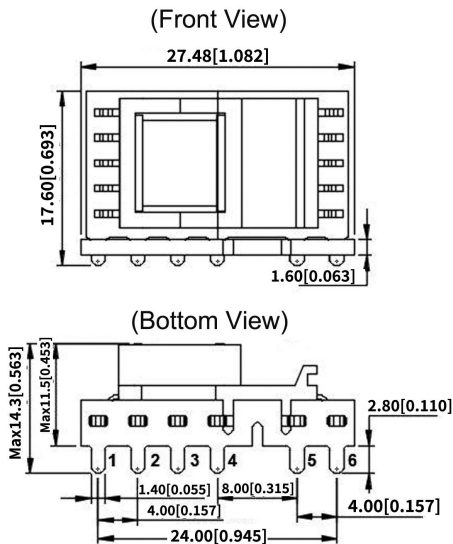
The grid distance size is 2.54mm*2.54mm

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: ± 0.10 [± 0.004]
 Unmarked dimensional tolerance: ± 1.00 [± 0.039]

AS03-23Sxx-F Dimensions and Recommended Layout

Third Angle Projection



The grid distance size is 2.54mm*2.54mm

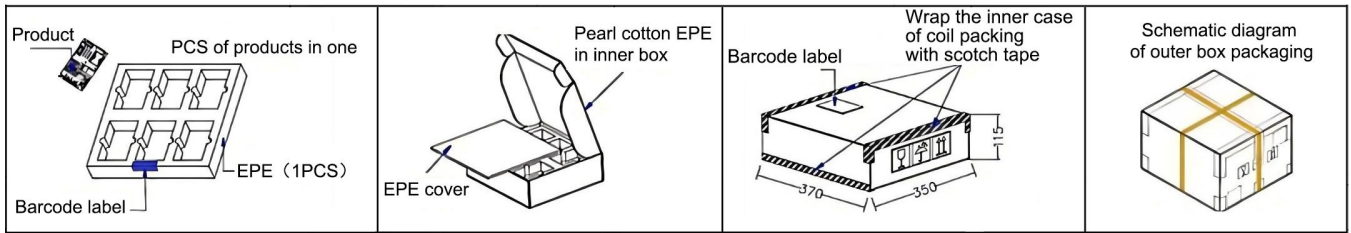
Pin	Function
1	AC (L)
2	AC (N)
3	+V (CAP)
4	-V (CAP)
5	-Vo
6	+Vo

Note:
 Size unit: mm [inch]
 Pin diameter tolerance: ± 0.10 [± 0.004]
 Unmarked dimensional tolerance: ± 1.00 [± 0.039]

Packaging Information

Model series	Product quantity(pcs/tray)	Inner carton quantity(pcs/carton)	Outer carton quantity(pcs/carton)
AS03-23Sxx(-P)	140	420	840
AS03-23Sxx-F	140	420	840

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

Bettpower Guangzhou Electronic Technology Co., Ltd.

Website: www.bettpower.com

Telephone: +86 - 020 - 32166256

Email: info@bettpower.com

Address: Room 2514-2515, Building A1,1 Doutang Road, Huangpu District, Guangzhou, China

BETTPOWER is a registered trademark of BETTPOWER Guangzhou Electronic Technology Co., Ltd. All of its product names, models, trademarks and brands are the property of the Company.

BETTPOWER Guangzhou Electronic Technology Co., Ltd reserves all rights and the right of final interpretation.