

AD10-23Sxx Series

AC-DC Converter | 10W | Compact size | DIP | 4000VAC | 85~305VAC



Features

- Universal Input: 85~305VAC / 100~430VDC
- Operating temperature range: -40°C ~ +85°C
- Isolation voltage: 4000VAC
- High efficiency up to: 85%(Typ.)
- Overvoltage category III (OVC III)
- EMI Class B without additional component
- Designed to meet IEC/EN/UL62368, EN60335, EN61558

Product description



AD10-23Sxx series is a 10W miniature AC DC module-type power supply provided by BETTPOWER. This series features ultra wide input voltage range, dual-use of AC and DC, low power consumption, high efficiency, high reliability, and reinforced isolation. The entire series is compliance with BS EN/EN55032 Class B without the need of any additional components. The EMC and safety specification design complies with IEC/EN61000-4, CISPR32/EN55032, IEC/EN/UL62368/EN60335/EN61558. These power supply modules are widely used in industries, power generation, household appliances, instrumentation, communication, and civil applications.

Selection Guide

Certification	Part No.	Input Voltage (VAC)	Out Power (W)	Out Voltage (VDC)	Out Current Max.(mA)	Full Load Efficiency %(230VAC, Typ.)	Capacitive Load Max.(μF)
EN/UL pending	AD10-23S03	85~305	8.6	3.3	2600	75	6000
	AD10-23S05	85~305	10	5	2000	79	5000
	AD10-23S09	85~305	10	9	1100	81	3600
	AD10-23S12	85~305	10	12	830	83	2000
	AD10-23S15	85~305	10	15	660	84	820
	AD10-23S18	85~305	10	18	556	84	820
	AD10-23S24	85~305	10	24	410	85	470

Note:

1. All the above data were tested within the parameter range of typical application circuits.
2. The product images are for reference only. Please refer to the actual product for details.
3. Adding "T" to the product model suffix indicates an extension for chassis mount packaging, while adding "Din" to the suffix indicates an extension for Din-rail mount packaging.

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	--	--	0.23	A
	230VAC	--	--	0.15	A
Inrush Current	115VAC	--	25	--	A
	230VAC	--	40	--	A
Input Frequency		47	--	63	Hz
Recommended External Input Fuse		2A/300V, slow-blow, required			
Leakage Current	230VAC/50Hz	0.1mA RMS Max.			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	10% ~ 100% load	--	±2	--	%
Line Regulation	Full load	--	±0.5	--	%
Load Regulation	0 ~ 100% load	--	±1.0	--	%
Ripple & Noise*	20MHz bandwidth (peak-to-peak value), 10% ~ 100% load	--	60	150	mV
Temperature Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption	230VAC	--	0.10	--	W
Min. Load		0	--	--	%
Over-current Protection		110	--	--	%Io
Short Circuit Protection		Continuous, Self-Recovery			
Hold-up Time	230VAC	--	40	--	ms

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	
Insulation Resistance	Input-output, insulated voltage 500VDC	100	--	--	MΩ	
Power Derating	+50°C ~ +85°C	3.3V/5V	1.71	--	%°C	
	+55°C ~ +85°C	9/12/15/18/24V	2.0	--	%°C	
	85VAC ~ 100VAC		1.0	--	--	%/VAC
	277VAC ~ 305VAC		0.54	--	--	%/VAC

Operating Temperature		-40	--	85	°C
Storage Temperature		-40	--	105	°C
Storage Humidity	Non-condensing	--	--	95	%RH
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,EN61558-1,EN60335-1;UL62368-1				
Safety Class	CLASS II				
MTBF	MIL-HDBK-217F@25°C	>3,200,000h			

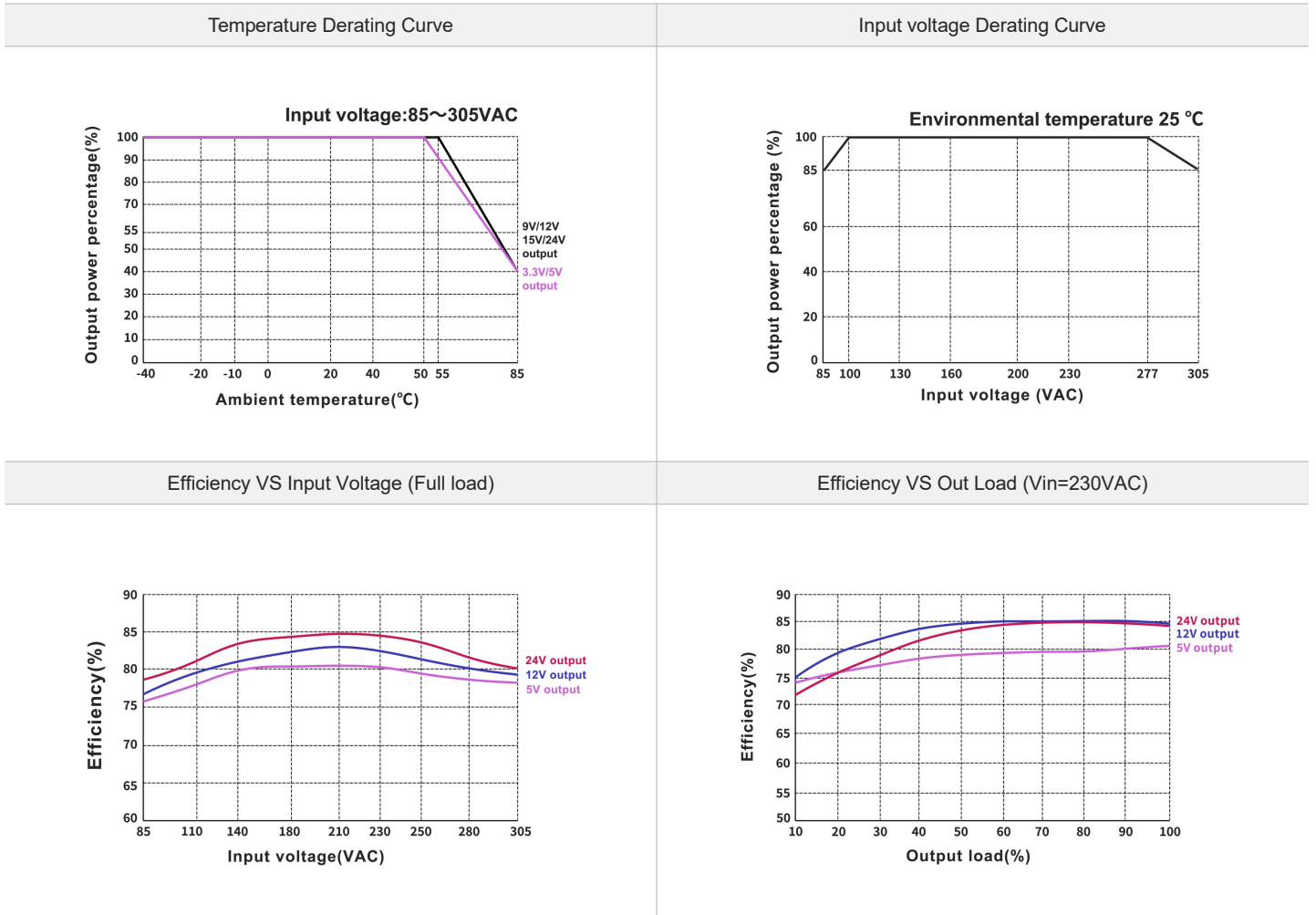
Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Package Dimensions	40.00 * 25.40 * 21.50mm
Weight	36.6g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS B EN55014-1	
	RE	CISPR32/EN55032 CLASS B EN55014-1	
EMS	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
		EN55014-2	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV(EMC Solutions - Recommended Circuit(2-1))	perf. Criteria B
		IEC/EN61000-4-4 ±4KV(EMC Solutions - Recommended Circuit(2-2))	perf. Criteria A
		EN55014-2	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±1KV	perf. Criteria B
		IEC/EN61000-4-5 line to line ±2KV(EMC Solutions - Recommended Circuit(2-2))	perf. Criteria B
		IEC/EN61000-4-5 line to line ±2KV/line to PE ±4KV/(EMC Solutions - Recommended Circuit(2-2))	perf. Criteria A
		EN55014-2	perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
EN55014-2		perf. Criteria A	
ESD	IEC/EN61000-4-2 Contact ±8KV/ Air±15KV	perf. Criteria B	

Product Characteristic Curve

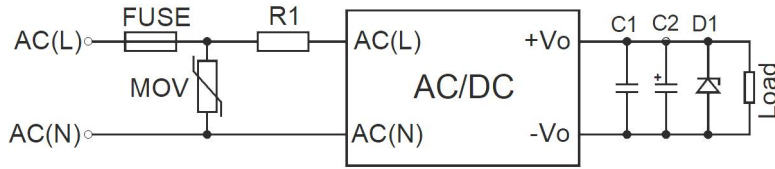


Note:

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(Figure 1)



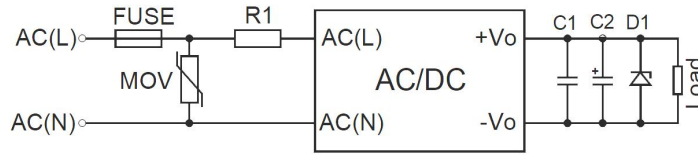
Reference Table for Selection of Peripheral Devices

Part No.	FUSE	MOV	R1	C1	C2	D1
AD10-23S03	2A/300VAC Slow-blow Required	14D561K	12Ω/5W Wire-wound resistor Required	1uF/16V	220uF/16V	See Note
AD10-23S05				1uF/16V	220uF/16V	
AD10-23S09				1uF/25V	100uF/25V	
AD10-23S12				1uF/25V	100uF/25V	
AD10-23S15				1uF/50V	100uF/35V	
AD10-23S18				1uF/50V	100uF/35V	
AD10-23S24				1uF/50V	100uF/35V	

- Note:
1. FUSE and MOV can be selected based on actual needs.
 2. 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.

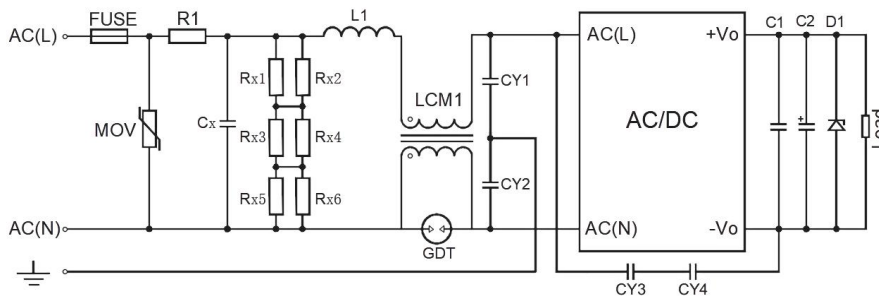
Design Reference - EMC Solutions - Recommended Circuits

EMC Solutions - Recommended Circuits(Figure 2-1)



EMC Solutions - Recommended Circuits(Figure 2-2)

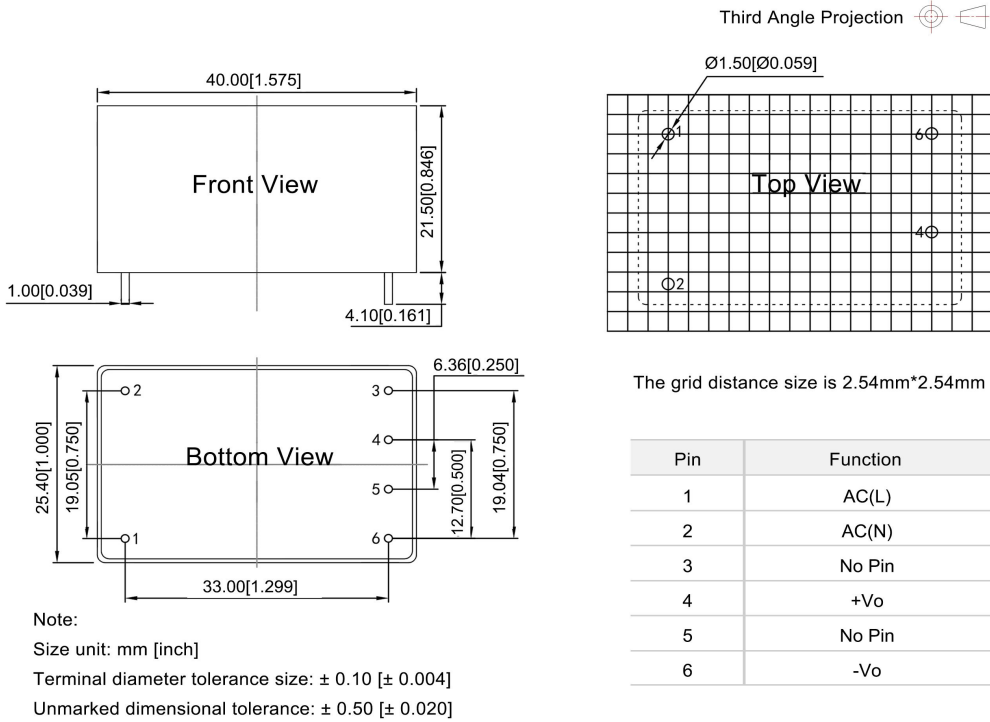
(When the output of the product needs to be connected to PE or connected to PE through Y capacitor,Recommended)



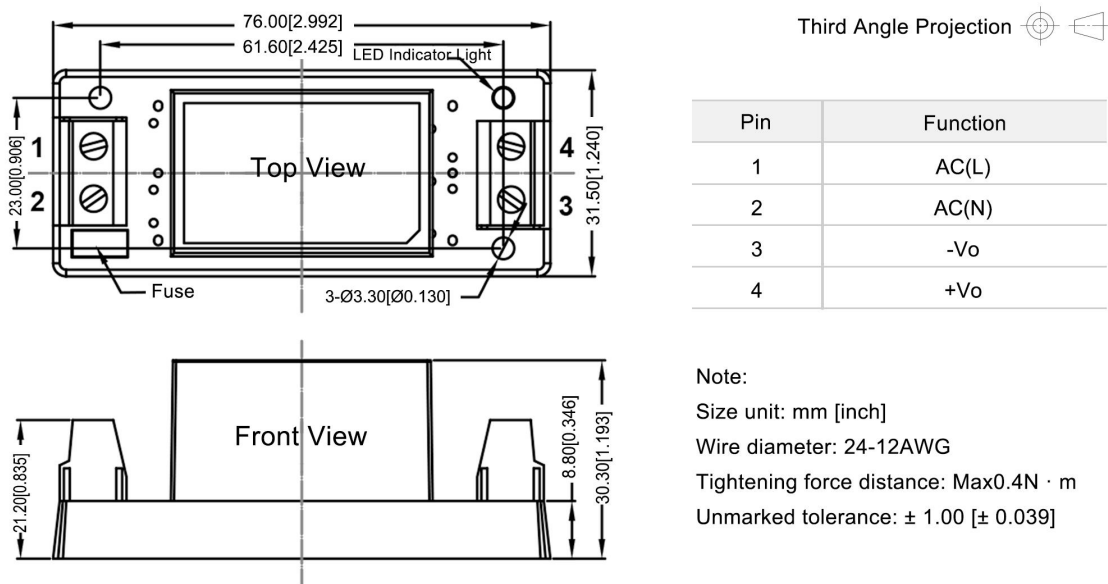
Recommended parameter values for EMC solution circuits	Model	Recommended value
	FUSE	2A/300VAC,Slow-blow, Required
	MOV	14D561K
	R1	12Ω/5W(Wire-wound resistor,Required)
	Cx	0.33uF/305VAC
	L1	1.2mH/0.5A
	CY1,CY2	2.2nF/400VAC
	CY3,CY4	1.0nF/400VAC
	GDT	300V/1KA
	LCM	22mH Common mode Choke
	Rx1,Rx2,Rx3,Rx4	1.5MΩ/1206

Dimensions and Recommended Layout

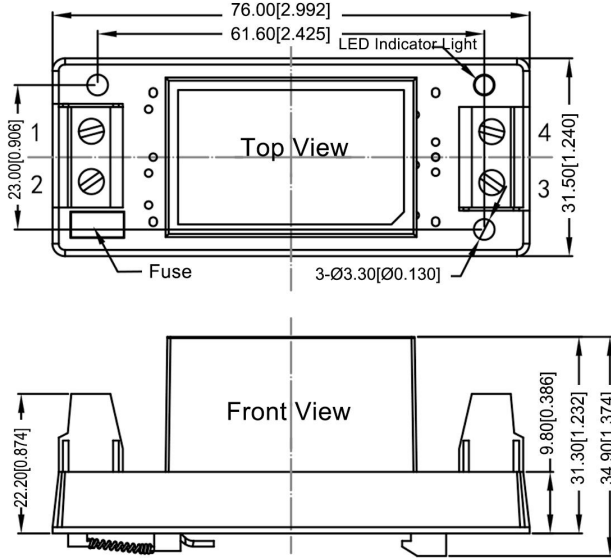
AD10-23Sxx Dimensions and Recommended Layout



AD10-23Sxx-T wired packaging Dimensions



AD10-23Sxx-DIN rail-mounted packaging Dimensions



Third Angle Projection

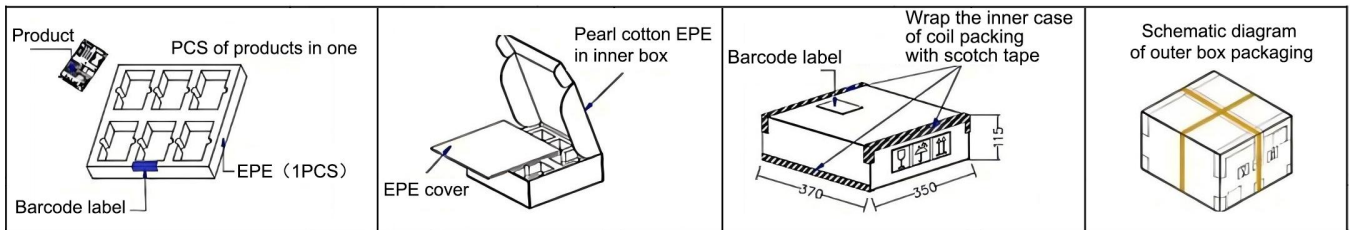
Pin	Function
1	AC(L)
2	AC(N)
3	-Vo
4	+Vo

Note:
 Size unit: mm [inch]
 Wire diameter: 24-12AWG
 Tightening force distance: Max0.4N · m
 Rail type: TS35, rail needs to be grounded
 Unmarked tolerance: ± 1.00 [± 0.039]

Packaging Information

Model series	Product quantity(pcs/tray)	Inner carton quantity(pcs/carton)	Outer carton quantity(pcs/carton)
AD10-23SXX	48	144	288
AD10-23SXX-T	28	56	112
AD10-23SXX-DIN	28	56	112

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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