

# AS10-26Sxx Series

AC-DC Converter | 10W | Small open frame | SIP | 4000VAC | 85~528VAC



## Features

- 1.5"x0.8" compact size, high power density
- Ultra-wide 90-528VAC and 100-745VDC input voltage range
- Working available with any two phases
- Operating temperature range: -40°C ~ +85°C
- Isolation voltage: 4000VAC
- High efficiency: up to 83%(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



AS10-26Sxx series is highly efficient green power AC-DC open frame power module. It features a compact design and supports ultra-wide input voltage range of 85~528Vac, 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	AS10-26S05	85~528	10	5	2000	77	1500
	AS10-26S09	85~528	10	9	1100	79	1000
	AS10-26S12	85~528	10	12	830	82	680
	AS10-26S15	85~528	10	15	670	82	470
	AS10-26S24	85~528	10	24	420	83	330

Note:

1. The above data were all tested within the parameter range of typical application circuits.
2. Output voltage refers to the voltage value at the load terminal after connecting the peripheral application circuit.
3. If the product is used in a severe vibration application, it needs to be glued and fixed.
4. 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	--	528	VAC
	DC input	100	--	745	VDC
Input Current	110VAC	--	--	0.30	A
	230VAC	--	--	0.15	A
Input Frequency		47	--	63	Hz
Recommended External Input Fuse		2A, slow-blow, required			
Leakage Current		0.5mA RMS Typ. 480VAC/50Hz			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	10% ~- 100% load	--	±5	--	%
Line Regulation	Rated load	--	±1.5	--	%
Load Regulation	10% ~- 100% load	--	±3.0	--	%
Ripple & Noise	20MHz bandwidth (peak-to-peak value), 10% ~ 100% load	--	100	180	mV
Temperature Coefficient		--	±0.2	--	%/°C
Stand-by Power Consumption	230VAC	--	--	0.3	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 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	1.5	--	--	%°C
	+55°C ~ +85°C	1.8	--	--	%°C
	85VAC ~ 100VAC	1.5	--	--	%/VAC
	480VAC ~ 528VAC	0.5	--	--	%/VAC
Operating Temperature		-40	--	85	°C
Storage Temperature		-40	--	105	°C
Storage Humidity		--	--	95	%RH

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/UL62368-1,IEC/EN60335-1,IEC/EN61558-1	
Safety Class	CLASS II	
MTBF	MIL-HDBK-217F@25°C	>500,000h

## Mechanical Specifications

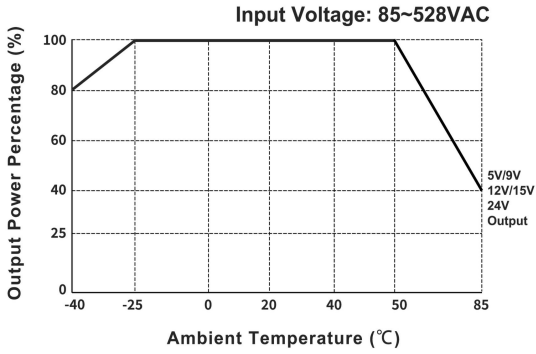
Package Dimensions	38.00 * 20.00 * 15.25mm
Weight	11.2g(Typ.)
Cooling Method	Free air convection

## Electromagnetic Compatibility (EMC)

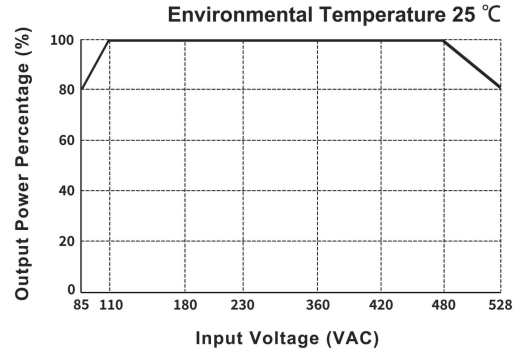
EMI	CE	CISPR32/EN55032 CLASS A (EMC Solutions - Recommended Circuits 1,4,5,6)	
	RE	CISPR32/EN55032 CLASS A (EMC Solutions - Recommended Circuits 2,3)	
EMS	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV (EMC Solutions - Recommended Circuits 1,4,6)	perf. Criteria B
	Surge	IEC/EN61000-4-5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

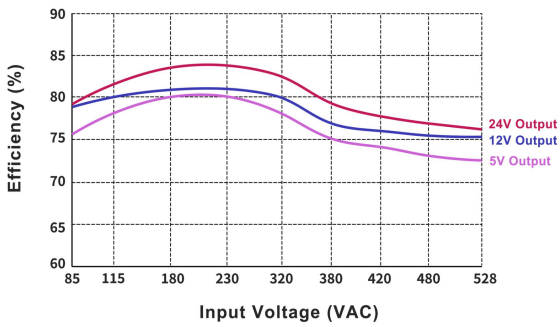
Temperature Derating Curve



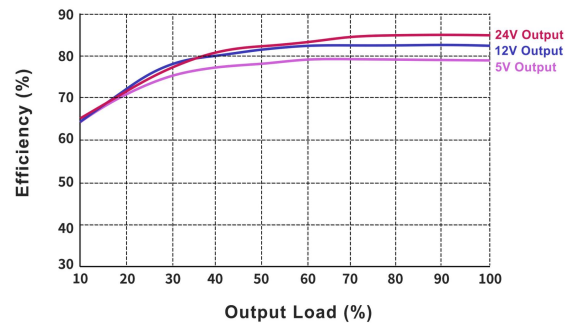
Input voltage Derating Curve



Efficiency VS Input Voltage (Full load)

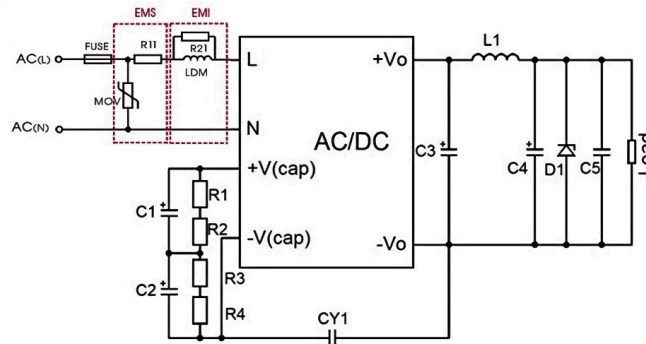


Efficiency VS Out Load (Vin=230VAC)



Design Reference - Application circuit

Application circuit



Reference Table for Selection of Peripheral Devices 1

Part No.	FUSE	C1,C2 (required)	R21	R11	R1,R2,R3,R4	MOV	LDM
AS10-26S05	2A/500VAC Slow-blow Required	47uF/400V	10K/1206 (Chip Resistor)	6.8Ω/3W (Wire-wound resistor, Required)	1MΩ/1206 (required)	14D911K	2.2mH Max: 4.81Ω Min: 0.31A
AS10-26S09							
AS10-26S12		33uF/400V	4.7K/1206 (Chip Resistor)				
AS10-26S15							
AS10-26S24							

Reference Table for Selection of Peripheral Devices 2

Part No.	CY1	L1	C3	C4	C5	D1
AS10-26S05	1nF/400VAC (required)	2.2uH/6.5A	820uF/16V (solid-state capacitor)	680uF/25V	0.1uF/25	See note
AS10-26S09			470uF/25V (solid-state capacitor)	330uF/25V	0.1uF/25	
AS10-26S12			470uF/35V	100uF/35V	0.1uF/50	
AS10-26S15						
AS10-26S24						

- Note:
- FUSE or front-end EMC and EMI components can be selected according to actual application requirements.
  - C1,C2 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. It is recommended to use electrolytic capacitor C1/C2 with ESR≤100Ω at low temperature.
  - C4 is an output filtering electrolytic capacitor (must be externally connected), which forms a Pi type filtering circuit with C3 and L1. It is recommended to use high-frequency low resistance electrolytic capacitors (ESR ≤ 1.1 Ω for C4 at -40 °C) or solid-state capacitors. When applied in normal and high temperature environments, C4 can use electrolytic capacitors. Please refer to the technical specifications provided by each manufacturer for capacity and rated ripple current. The capacitance withstand voltage should be reduced to at least 80%. C4 is a ceramic capacitor used to filter out high-frequency noise.
  - 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	90~528VAC	-40°C ~ +85°C	Class A	Level 3
2	Indoor general environment	Intelligent building/Intelligent agriculture	90~528VAC	-25°C ~ +55°C	Class B	Level 4
3	Indoor industrial environment	Manufacturing workshop	90~528VAC	-25°C ~ +55°C	Class B	Level 4
4	Outdoor general environment	ITS/Video monitoring/Charging point/Communication/Security and protection	90~528VAC	-40°C ~ +85°C	Class A	Level 4
5	Outdoor industrial environment	Electricity/Grid	90~528VAC	-40°C ~ +85°C	Class B	Level 4
6	Strong lightning surge	Electricity dedicated	90~528VAC	-40°C ~ +85°C	Class B	Level 4

Immunity design circuits for reference

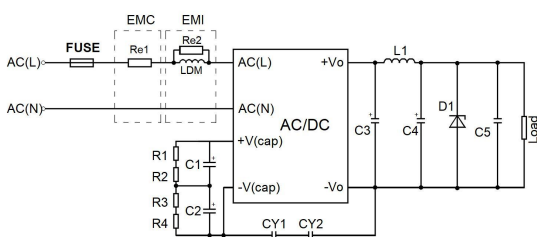
Emissions design circuits for reference

Level 3	Level 4	Circuit 1,2	Circuit 3,4	Circuit 5

## Design Reference - EMC Solutions - Recommended Circuits

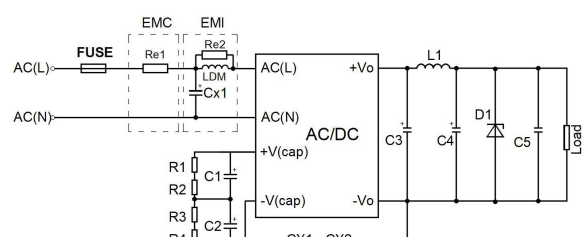
EMC Solutions - Recommended Circuits 1

Basic application

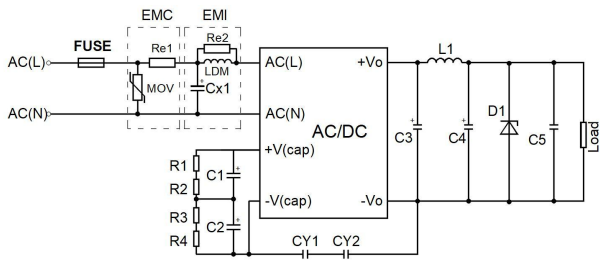


EMC Solutions - Recommended Circuits 2

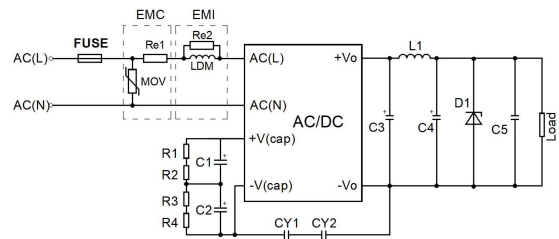
Indoor general environment



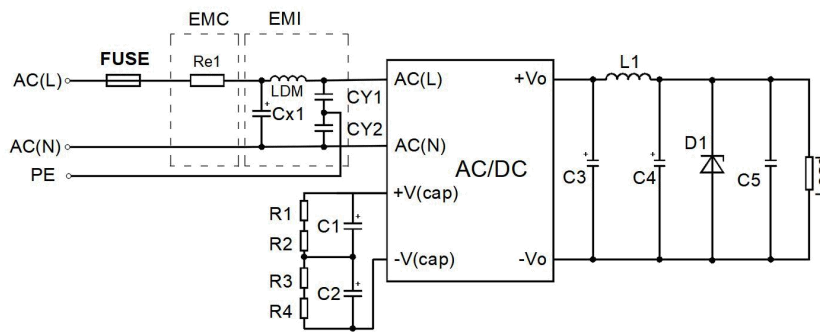
EMC Solutions - Recommended Circuits 3  
Indoor industrial environment



EMC Solutions - Recommended Circuits 4  
Outdoor Industrial environment



EMC Solutions - Recommended Circuits 5  
Strong lightning surge



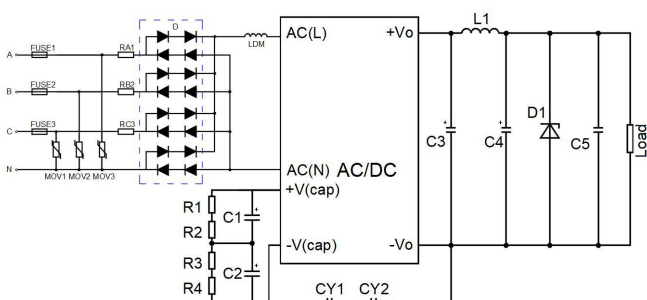
Recommended parameter values for EMC solution circuits

Model	Circuit 1	Circuit 2	Circuit 3	Circuit 4	Circuit 5
FUSE	2A/500V, Slow-blow, Required				
Re1	6.8Ω/3W (Wire-wound resistor, Required)				
MOV	14D911K				
Re2	5V,9V, 12V Output	10K/1206(1/4W)			
	15V,24V Output	4.7K/1206(1/4W)			
LDM	2.2mH/Max: 4.8Ω/Min:0.35A				
CX1	0.1uF/480VAC				

## Design Reference - EMC Solutions - Strong lightning strike surge environment

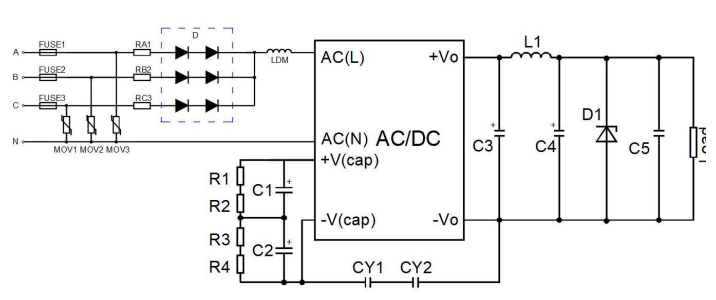
EMC Solutions - Recommended Circuits 6-1

Require 4KV differential-mode surge standard (full-wave rectification)



EMC Solutions - Recommended Circuits 6-2

Require 4KV differential-mode surge standard (half-wave rectification)



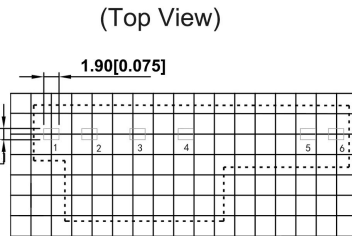
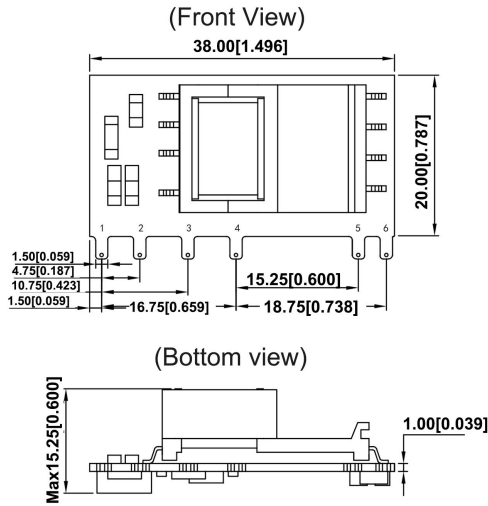
Reference Table for Selection of Peripheral Devices

Model	Circuit 6-1	Circuit 6-2
FUSE1,FUSE2,FUSE3	6.3A/500VAC,Slow-blow, Required	
MOV1,MOV2,MOV3	14D911K	
RA1,RB2,RC3	12Ω/5W (Wire-wound resistor, Required)	
LDM	2.2mH/Max: 4.8Ω/Min:0.35A	
D	2A/1000V	

## Dimensions and Recommended Layout

AS10-26Sxx Dimensions and Recommended Layout

Third Angle Projection



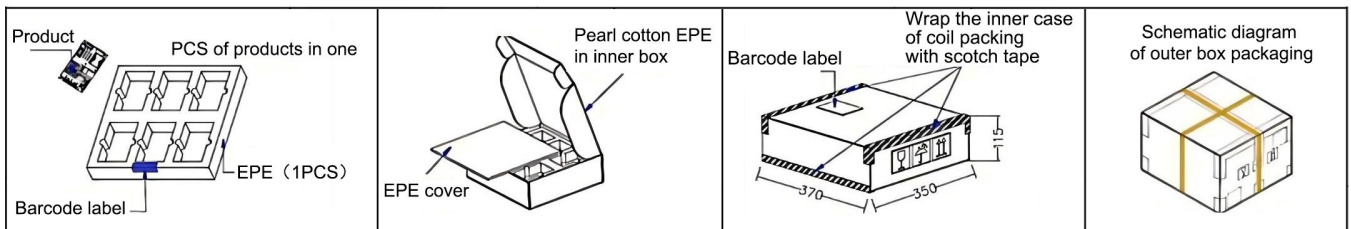
Pin	Function
1	AC(L)
2	AC(N)
3	+V(CAP)
4	-V(CAP)
5	-Vo
6	+Vo

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)
AS10-26SXX	108	324	648

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](http://www.bettpower.com)

Telephone: +86 - 020 - 32166256

Email: [info@bettpower.com](mailto:info@bettpower.com)

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

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