AS05-26Sxx Series

AC-DC Converter | 5W | Small open frame | SIP | 4000VAC | 85～528VAC

Features

- 1.3''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℃ ～ +85℃
- Isolation voltage: 4000VAC
- High efficiency: up to 79%(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

AS05-26Sxx 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 90~528Vac, high reliability, low power consumption and reinforced insulation. These power supply modules are particularly suitable for applications with strict space constrains, 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	AS05-26S03	85～528	3.3	3.3	1000	70	2200
	AS05-26S05	85～528	5	5	1000	71	1500
	AS05-26S09	85～528	5	9	550	73	680
	AS05-26S12	85～528	5	12	420	78	470
	AS05-26S15	85～528	5	15	330	79	330
	AS05-26S24	85～528	5	24	210	79	100

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	90	--	528	VAC
	DC input	110	--	745	VDC
Input Current	115VAC	--	--	0.2	A
	230VAC	--	--	0.1	A
Input Frequency		47	--	63	Hz
Recommended External Input Fuse		1A, slow-blow, required			
Leakage Current	230VAC/50Hz	0.2mA RMS Max.			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	typ.	Max.	Unit
Output Voltage Accuracy	10% ～- 100% load	3.3V output	--	±3	±6	%
		Other	--	±2.5	±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	--	%/℃
Stand-by Power Consumption	230VAC		--	--	0.3	W
Min. Load			10	--	--	%Io
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	100	--	--	MΩ
Power Derating	+55℃ ～ +85℃	2	--	--	%℃
	90VAC ～ 115VAC	1.6	--	--	%/VAC
	400VAC - 528VAC	0.312	--	--	%/VAC
Operating Temperature		-40	--	85	℃
Storage Temperature		-40	--	105	℃
Storage Humidity	Wave soldering	260 ± 5℃. time: 5 - 10s			

	Manual soldering	360 ± 10℃. 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℃	>500,000h

Mechanical Specifications

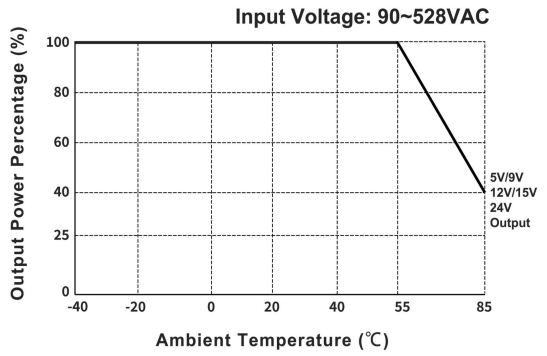
Package Dimensions	33.50 * 13.00 * 17.20mm
Weight	6.9g(typ.)
Cooling Method	Free air convection

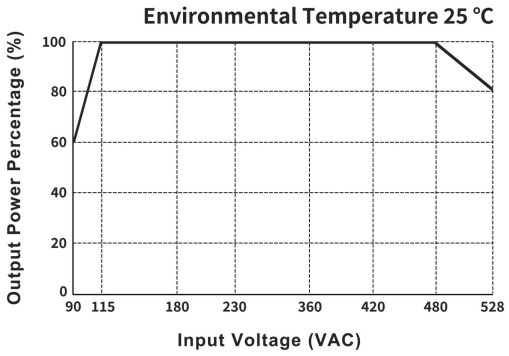
Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS A (EMC Solutions - Recommended Circuits 2,3)	
	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 ±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

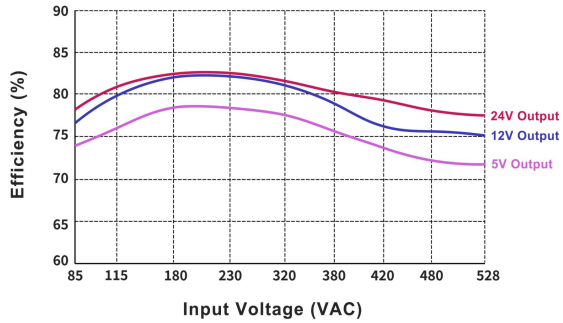
Product Characteristic Curve

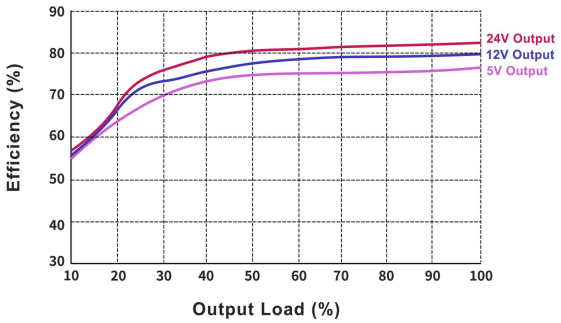
Temperature Derating Curve	Input voltage Derating Curve





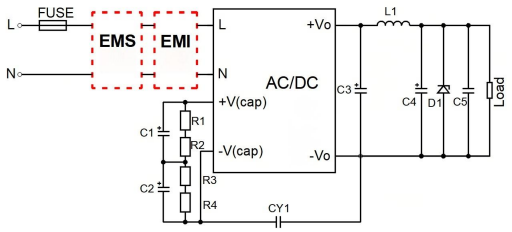
Efficiency VS Input Voltage (Full load)	Efficiency VS Out Load (Vin=230VAC)





Design Reference - Application circuit

Application circuit



Reference Table for Selection of Peripheral Devices 1-1

Input voltage	C1(required)	C2(required)	R1,R2,R3,R4	CY1
90～305VAC	22uF/450V	short-circuit	No circuit connection	1nF/400VAC
90～528VAC	47uF/400V	47uF/400V	1MΩ/1206(必接)	1nF/400VAC
170～528VAC	33uF/400V	33uF/400V	1MΩ/1206(必接)	1nF/400VAC

Reference Table for Selection of Peripheral Devices 1-2

Part No.	FUSE	L1	C3	C4	C5	D1
AS05-26S03	1A/500VAC Slow-blow Required	2.2uH/6A	1000uF/16V (electrolytic capacitor)	150uF/25V	0.1uF/25	See note
AS05-26S05		2.2uH/6A	1000uF/16V (electrolytic capacitor)	150uF/25V	0.1uF/25	
AS05-26S09		2.2uH/6A	270uF/16V (solid-state capacitor)	100uF/25V	0.1uF/25	
AS05-26S12		2.2uH/6A	270uF/16V (solid-state capacitor)	100uF/25V	0.1uF/25	
AS05-26S15		2.2uH/6A	220uF/35V	47uF/35V	0.1uF/50	
AS05-26S24		2.2uH/6A	220uF/35V	47uF/35V	0.1uF/50	

Note:

1.FUSE or front-end EMC and EMI components can be 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. It is recommended to use electrolytic capacitor C1 with ESR≤100Ω at low temperature.

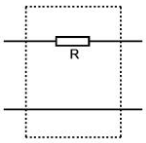
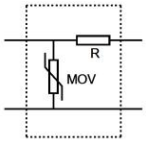
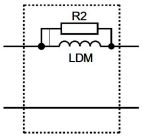
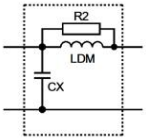
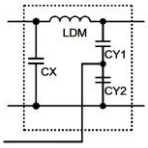
3.C3,C4,andL1 form a Pi type filtering circuit. It is recommended to use high-frequency and low resistance electrolytic capacitors or solid-state capacitors.When selecting L1,ripplere quirements can be considered,while paying attention to current and internal resistance values.

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.

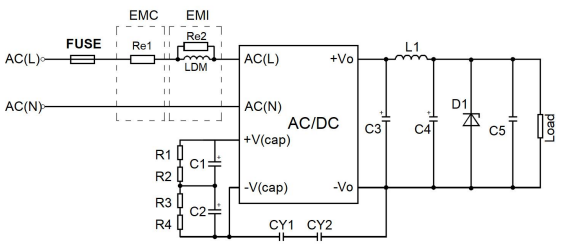
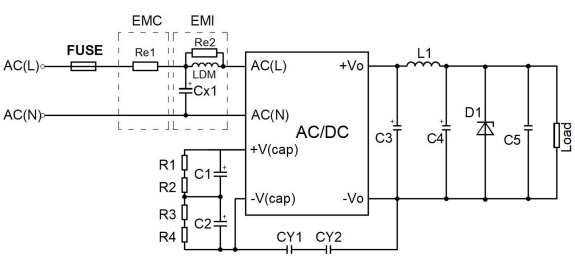
Design Reference - EMC Solutions - Environmental Application

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℃ ～ +85℃	Class A	Level 3
2	Indoor general environment	Intelligent building/Intelligent agriculture	90～528VAC	-25℃ ～ +55℃	Class B	Level 4
3	Indoor industrial environment	Manufacturing workshop	90～528VAC	-25℃ ～ +55℃	Class B	Level 4
4	Outdoor general environment	ITS/Video monitoring/Charging point/Communication/Security and protection	90～528VAC	-40℃ ～ +85℃	Class A	Level 4
5	Outdoor industrial environment	Electricity/Grid	90～528VAC	-40℃ ～ +85℃	Class B	Level 4
6	Strong lightning surge	Electricity dedicated	90～528VAC	-40℃ ～ +85℃	Class B	Level 4

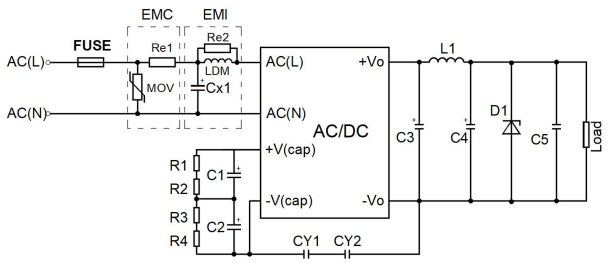
Immunity design circuits for reference		Emissions design circuits for reference		
Level 3	Level 4	Circuit 1,2	Circuit 3,4	Circuit 5
				

Design Reference - EMC Solutions - Recommended Circuits

EMC Solutions - Recommended Circuits 1 Basic application	EMC Solutions - Recommended Circuits 2 Indoor general environment
	

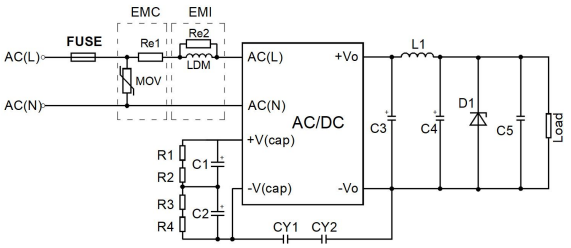
EMC Solutions - Recommended Circuits 3

Indoor industrial environment



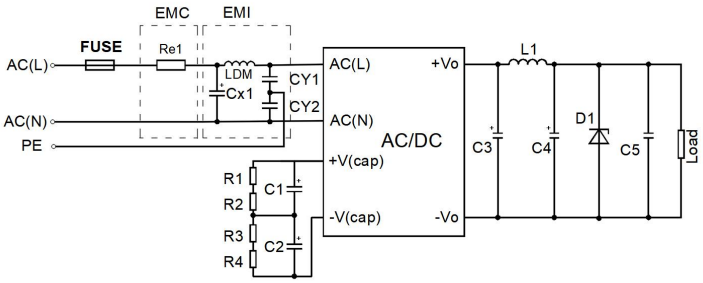
EMC Solutions - Recommended Circuits 4

Outdoor Industrial environment



EMC Solutions - Recommended Circuits 5

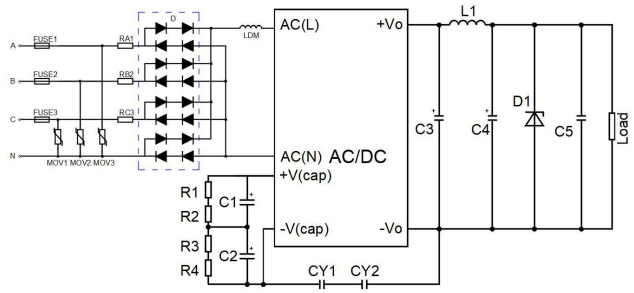
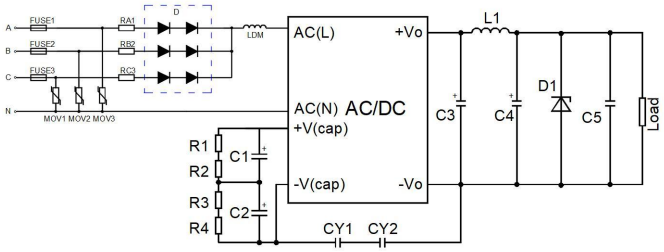
Strong lightning surge



Recommended parameter values for EMC solution circuits

Model		Circuit 1	Circuit 2	Circuit 3	Circuit 4	Circuit 5
FUSE		1A/500V,,Slow-blow, Required		2A/500V,Slow-blow, Required		
Re1		12Ω/3W (Wire-wound resistor, Required)				
MOV		14D911K				
Re2	5V,9V Output	20K/1206(1/4W)				
	12V Output	2K/1206(1/4W)				
	15V,24V Output	15K/1206(1/4W)				
LDM	5V Output	1.2mH/Max: 2.5Ω/Min: 0.2A				
	9V Output	2.2mH/Max: 15Ω/Min: 0.2A				
	12,15V,24V Output	4.7mH/Max: 15Ω/Min: 0.2A				
CX1		0.1uF/480VAC				

Design Reference - EMC Solutions - Strong lightning surge environment

Recommended circuit 6	Recommended circuit 7
High-requirement recommended peripheral circuit diagram for 4KV differential surge - full-wave rectification	Recommended peripheral circuit diagram for high-demand 4KV differential surge - half-wave rectification
	

EMC Recommended Circuit Component Selection Reference Table

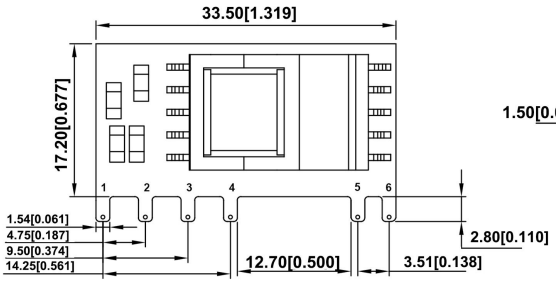
Model		Circuit 6	Circuit 7
FUSE1,FUSE2,FUSE3		3.15A/500VAC,Slowly melt and fuse, must be connected	
MOV1,MOV2,MOV3		14D911K	
RA1,RB2,RC3		12Ω/5W (wound resistor, required)	
Re2	3.3V,5V output	1.2mH/Max: 2.5Ω/Min: 0.2A	
	9V output	2.2mH/Max: 15Ω/Min: 0.2A	
	12V,15V,24V output	4.7mH/Max: 15Ω/Min: 0.2A	
D1		2A/1000V	

Dimensions and Recommended Layout

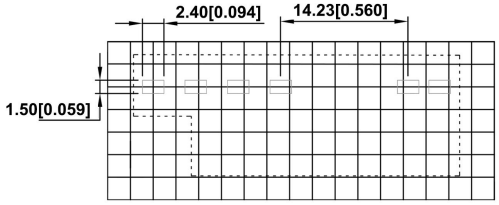
AS05-26Sxx Dimensions and Recommended Layout

Third Angle Projection

(Front View)

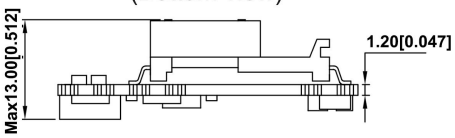


(Top View)



The grid distance size is 2.54mm*2.54mm

(Bottom view)



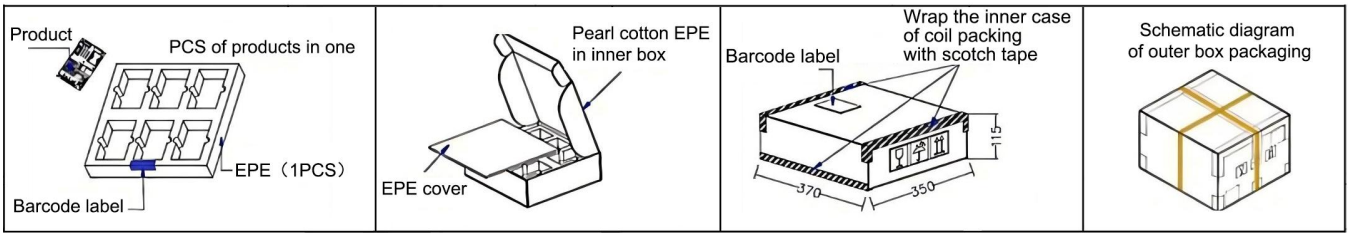
Pin	Function
1	AC(L)
2	AC(N)
3	+V(CAP)
4	-V(CAP)
5	-Vo
6	+Vo

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

Packaging Information

Model series	Product quantity(pcs/tray)	Inner carton quantity(pcs/carton)	Outer carton quantity(pcs/carton)
AS05-26Sxx	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 Ta=25 ℃, 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