85-305VAC wide voltage input, Isolated, single output, DIP package

FEATURES

- Wide voltage input 85-305VAC/100-430VDC
- High power density, high conversion efficiency
- Output low ripple noise
- With Equipped with short circuit, overcurrent and other protection functions, high reliability
- Isolation voltage 4000VAC
- EMI meets CISPR32/EN55032 CLASS B
- Meets IEC/EN62368/EN60355 certification standards

AW05-NSxx series product is a small-sized pin type potting module power supply. Application areas: power electronics, industrial control, new energy, Internet of Things, security, smart home, etc.

Selection Table

Part NO	Output Power Max	Output Voltage	Output Current	peak current	Efficiency at 230VAC(%) Typ.	Capacitive Load (uF) Max.
AW05-NS03	5W	3.3V	1500mA	1700mA	72%	4000uF
AW05-NS05	5W	5V	1000mA	1200mA	77%	3000uF
AW05-NS09	5W	9V	560mA	670mA	79%	1000uF
AW05-NS12	5W	12V	420mA	540mA	79%	820uF
AW05-NS15	5W	15V	335mA	420mA	80%	680uF
AW05-NS24	5W	24V	210mA	260mA	81%	220uF

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	/	305	VAC
	DC input	100	/	430	VDC
Input Frequency		47	/	63	Hz
Input Current	115VAC input, fully loaded	/	/	0.13	A
	230VAC input, fully loaded	/	/	0.07	
Inrush Current	Temperature 25℃, input 230V	/	25	/	
Hot swappable	No support				

Output characteristic parameters

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3VDC output	/	±3	/	%
	Other outputs	/	±2	/	
Line Regulation	Full load, input voltage changes from (Vmin – Vmax)	/	±0.5	/	
Load Regulation	230VAC, load changes from (0% - 100%)	/	±1	/	
Output Hold-up Time	230VAC, 100% load	/	50	/	ms
Temperature Coefficient	under rated load	/	±0.02	/	%/℃
Ripple & Noise①	20MHz bandwidth (peak-to-peak value)	/	100	/	mVp-p
Overcurrent protection	130%-150%Io, self recovery				
Short circuit protection	Hiccup type, capable of long-term short circuit and self recovery				

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Overvoltage protection	Output 3.3V/5V	⩽7.5V	Hiccup type, self-healing or output voltage clamp		
	Output 9V	⩽15V			
	Output 12V	⩽16V			
	Output 15V	⩽20V			
	Output 24V	⩽30V			

Note:
1. The output ripple voltage and noise of the power supply are measured with 0.1uF ceramic capacitor and 10uF electrolytic capacitor, and each output noise is tested in the bandwidth of 0 Hz to 20 MHz.

General characteristic parameters

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Isolation voltage	Input-Output, Test for 1min, leakage current ＜5mA			/	/	4000	VAC
Insulation resistance	Input-Output test voltage: 500VDC			100	/	/	MΩ
Switching Frequency				/	65	/	kHz
Storage temperature	Standard packaging			-40	/	+100	℃
Working temperature	Rated state			-40	/	+85	
Storage humidity				/	/	95	%RH
Working humidity	In non condensing state			20	/	85	
Working altitude				/	/	2000	m
Power derating	Reduced working temperature	-40℃ to -25℃		3.0	/	/	%/℃
		+55℃ to +70℃	3.3VDC	1.8	/	/	
			Others	2.4	/	/	
		+70℃ to +85℃	3.3VDC	1.7	/	/	
			Others	1.0	/	/	
	Input voltage derating	85-100VAC		1.0	/	/	%/VAC
		277-305VAC		0.6	/	/	
Safety Standard	EN60355-1 & EN62368-1						
Safety Class	CLASSⅡ						
MTBF	MIL-HDBK-217F at 25℃ ⩾2,200Khours						
Soldering Temperature	Manual-welding time: 3 - 5s				350±10		℃
	Wave-soldering time: 5 - 10s				260±5		

Electromagnetic Compatibility

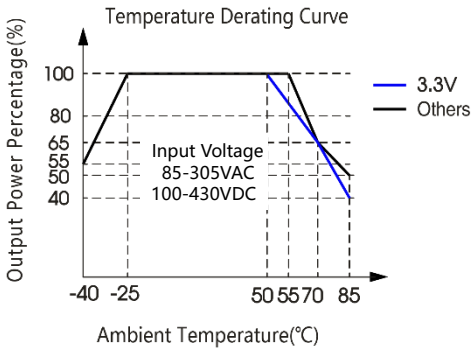
Item		
CE	CISPR32/EN55032 CLASS B	
RE	CISPR32/EN55032 CLASS B	
ESD	EN61000-4-2 ,Contact ±6KV/Air ±8KV	Perf, Criteria A
Radiated immunity	EN61000-4-3 ,80MHz – 1GHz 10V/m	Perf, Criteria A
EFT/burst	EN61000-4-4,± 2KV (refer to recommended circuit diagram 1)	Perf, Criteria A
	EN61000-4-4,± 4KV (refer to recommended circuit diagram 2)	Perf, Criteria A
Surge	EN61000-4-5, line to line ±1KV(refer to recommended circuit diagram 1)	Perf, Criteria A
	EN61000-4-5, line to line ±2KV(refer to recommended circuit diagram 2)	Perf, Criteria A
Conducted immunity	EN61000-4-6 ,0.15MHz-80MHz 10Vr.m.s	Perf, Criteria A
voltage dips and interruption	EN61000-4-11 ,0%, 70%	Perf, Criteria B

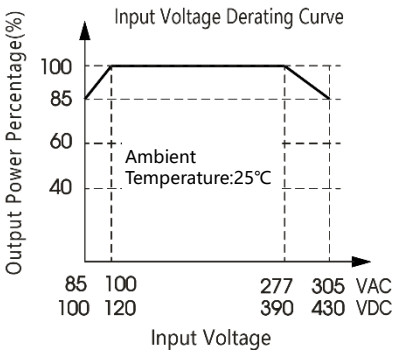
Note: ① When the output terminal of the product needs to be connected to the ground terminal through a Y capacitor or tightly attached to a metal shell, please refer to the recommended circuit(Figure 2).;
② Unless otherwise specified, EMC performance indicators are tested according to typical application circuits (Figure 1).

Other parameters

Item	
External dimensions	25.4*25.4*17.6mm(1.000*1.000*0.693inches)
Weight	18.5g(Typ.)
Housing material	Black flame retardant heat resistant plastic (UL94 V-0)
Cooling mode	Natural air cooling

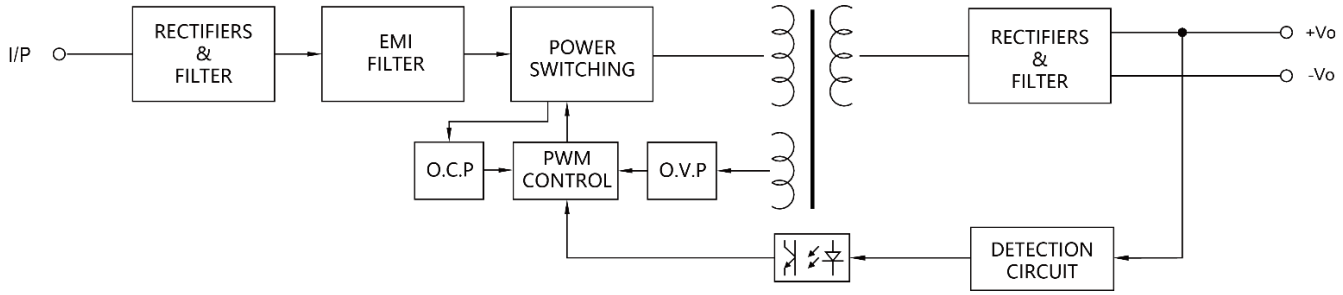
Product Characteristic Curve





Note:
For the input voltage 85-100VAC/100-120VDC , 277-305VAC/390-430VDC Voltage derating should be carried out on the basis of temperature derating.

Electrical Block Diagram



Design Reference

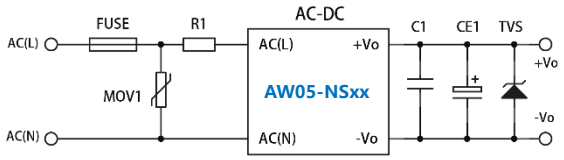


Fig.1 Typical circuit diagram

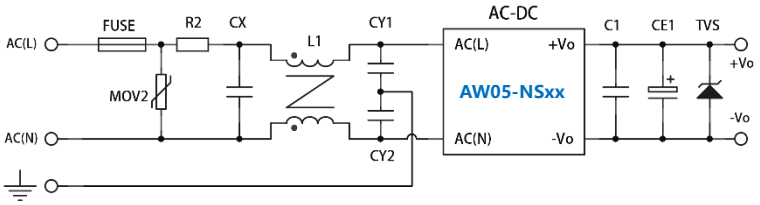
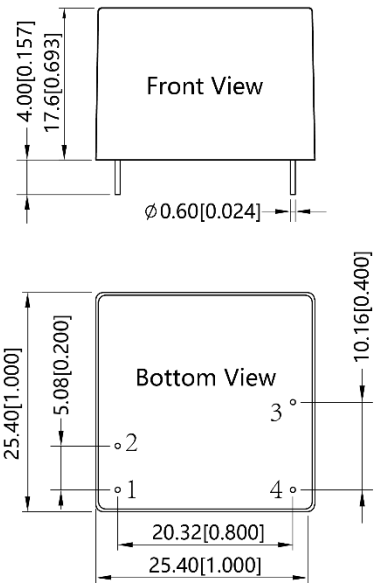


Fig.2 EMC application circuit with higher requirements

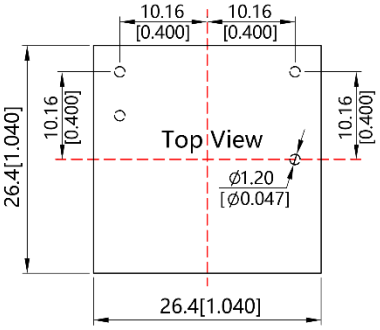
External device specification reference value						
General Components Parameters				Part No. Components Parameters		
Components	Recommended Value	Component	Recommended Value	Part No.	CE1	TVS
FUSE	1A/300V slow-blow	CY1, CY2	1nF/400VAC	AW05-NS03	220uF/10V	SMBJ7.0A
MOV1	10D561K	C1	1uF/50V	AW05-NS05	100uF/25V	SMBJ7.0A
MOV2	14D561K			AW05-NS09	100uF/25V	SMBJ12A
R1	10Ω/3W			AW05-NS12	100uF/25V	SMBJ20A
R2	33Ω/3W			AW05-NS15	68uF/25V	SMBJ20A
CX	0.1uF/310V			AW05-NS24	47uF/35V	SMBJ30A
L1	10-20mH, UU9.8 type common mode inductor					

Note:
1. FUSE Required , Recommend slow-blow ;
2. C1 is a ceramic capacitor used for filtering high-frequency noise
3. CE1 using an electrolytic capacitor with high frequency, and low ESR rating
4. TVS is arecommended suppressor diode to protect the application in case of a converter failure.

Dimensions and Recommended Layout



units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
Other tolerance: ±0.50 [±0.020]



Recommended PCB package size

PIN CONNECTIONS	
1	AC(N)
2	AC(L)
3	-Vo
4	+Vo

Note:
1. Qituo technology reserves the right to change the product at any time without notice;
2. The product shall be provided with a 3-year warranty period;
3. Unless otherwise specified, the products in this manual are not authorized to be used for key components of equipment requiring high reliability, so as not to affect the safety or effectiveness of the device;
4. All parameters in this manual are measured under indoor ta=25 ℃, humidity <75%, nominal input voltage and output rated load;

Shenzhen City QITOL Technology Co. Ltd
E-mail: qitol@qitol.com
WWW: www.qitol.com