

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



AW03-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.
AW03-NS03	3W	3.3V	910mA	1100mA	72%	4000uF
AW03-NS05	3W	5V	600mA	800mA	76%	3000uF
AW03-NS09	3W	9V	335mA	450mA	77%	1000uF
AW03-NS12	3W	12V	250mA	340mA	78%	820uF
AW03-NS15	3W	15V	200mA	270mA	78%	680uF
AW03-NS24	3W	24V	125mA	170mA	79%	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	/	/	0.08	A
	230VAC input, fully loaded	/	/	0.06	
Inrush Current	Temperature 25°C, 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	/	%/°C
Ripple & Noise [Ⓞ]	20MHz bandwidth (peak-to-peak value)	/	100	/	mVp-p
Overcurrent protection	150%-200%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			
	Output 9V	≤ 15V			
	Output 12V	≤ 16V			
	Output 15V	≤ 20V			
	Output 24V	≤ 30V			

Hiccup type, self-healing or output voltage clamp

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	°C
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	+70°C to +85°C	3.3VDC	/	/	% / °C
			Others	2.4	/	
	Input voltage derating	85-100VAC	1.4	/	/	%/VAC
Safety Standard	EN60355-1 & EN62368-1					
Safety Class	CLASS II					
MTBF	MIL-HDBK-217F at 25°C	≥ 2,700Khours				
Soldering Temperature	Manual-welding time: 3 - 5s			350±10		°C
	Wave-soldering time: 5 - 10s			260±5		

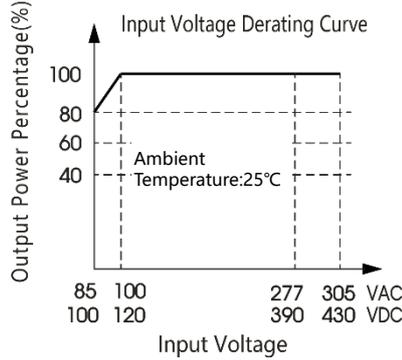
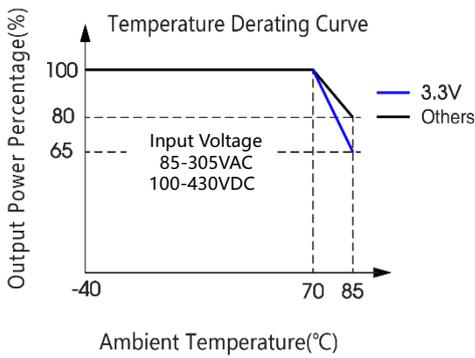
Electromagnetic Compatibility						
Item						
CE	CISPR32/EN55032 CLASS B					
RE	CISPR32/EN55032 CLASS B					
ESD	EN61000-4-2 ,Contact ±6KV/Air ±8KV				Perf, Criteria A	
Radiated immunity	EN61000-4-3 ,80MHz – 1GHz 10V/m				Perf, Criteria A	
EFT/burst	EN61000-4-4,± 2KV (refer to recommended circuit diagram 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).

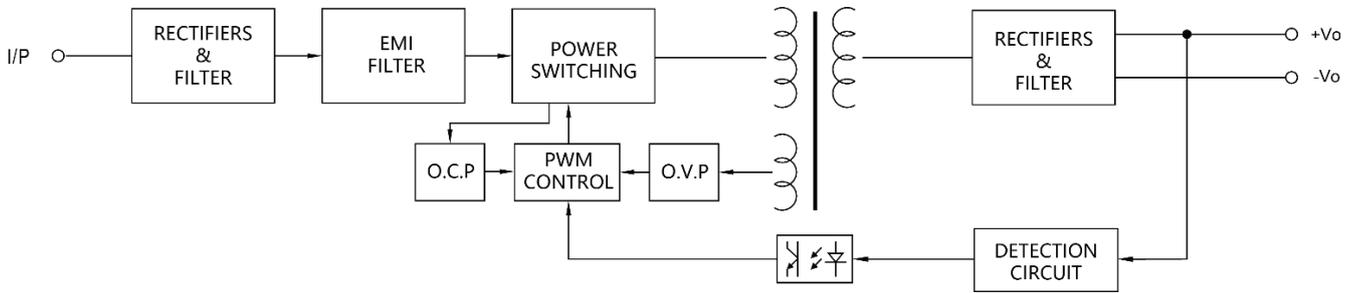
Other parameters	
Item	
External dimensions	25.4*25.4*17.6mm(1.000*1.000*0.693inches)
Weight	18.5g(Typ.)
Housing material	Black flame retardant heat resistant plastic (UL94 V-0)
Cooling mode	Natural air cooling

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

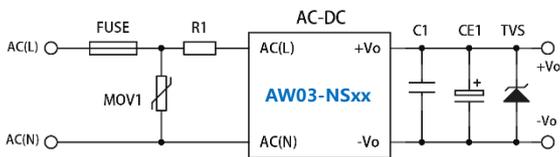


Fig.1 Typical circuit diagram

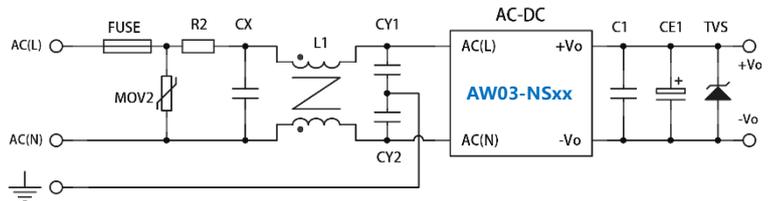


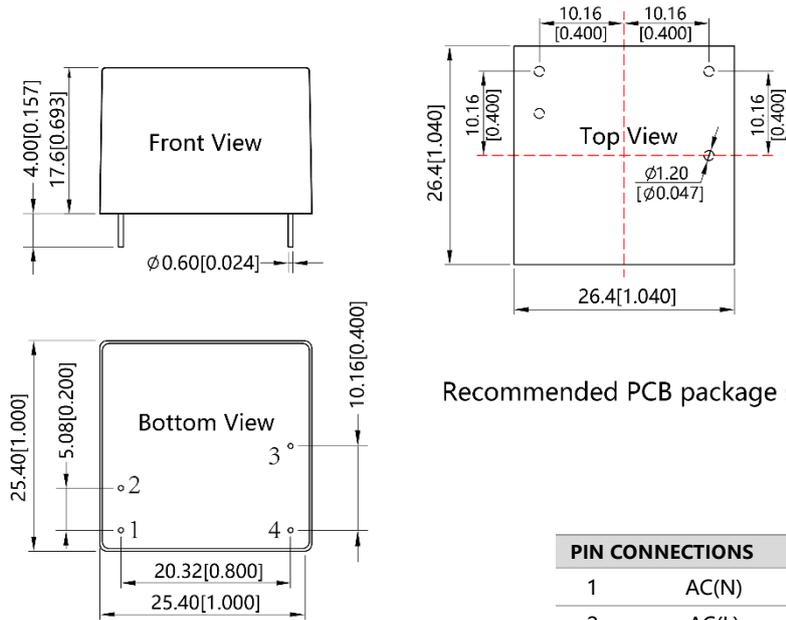
Fig.2 EMC application circuit with higher requirements

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	AW03-NS03	220uF/10V	SMBJ7.0A
MOV1	10D561K	C1	1uF/50V	AW03-NS05	100uF/25V	SMBJ7.0A
MOV2	14D561K			AW03-NS09	100uF/25V	SMBJ12A
R1	10Ω/3W			AW03-NS12	100uF/25V	SMBJ20A
R2	33Ω/3W			AW03-NS15	68uF/25V	SMBJ20A
CX	0.1uF/310V			AW03-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



Recommended PCB package size

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

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

- 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 $t_a=25$ °C, humidity <75%, nominal input voltage and output rated load;

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