

Typical Features

- ◆ Wide input voltage range 85-305VAC/70-430VDC
- ◆ No load power consumption $\leq 0.40\text{W}@230\text{VAC}$
- ◆ Efficiency up to 73%(Typ.)
- ◆ Operating temperature from -40 to +85°C
- ◆ Short circuit & over current protections
- ◆ Mini size open-frame, industrial grade design
- ◆ PCB SIP mounting



A03-C1SXXM



A03-C1SXXM-1

Application Field

A03-C1SXXM(-1) Series --- Mini size, high efficiency open-frame power supplies with global input voltage range (both AC & DC available), low ripple, low temperature rise, low standby power consumption, high efficiency & reliability and good EMC performance. This series of products can be widely used in the fields of Electric power, Industry, Instrument & Smart home devices, etc. Additional circuit for EMC is recommended for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Input Voltage Range		Output Specifications			Max Capacitive Load @230VAC (μF)	Ripple & Noise 20MHz (Max) mVp-p	Efficiency @Full load 230VAC (Typ.) %
		Nominal	Range	Power	Voltage	Current			
		(VAC)	(VAC)	P(W)	Vo(VDC)	Io(mA)			
-	A03-C1S05M(-1)	230	85-305	1	5	200	500	150	57
	A03-C1S12M(-1)			3	12	250	330	150	73

Note 1: This series of power supplies are not isolated, there is no insulation between input and output, ground protection is needed against electric shock.

Note 2: The part number suffix -1 indicates another PCB size version which can keep the same performance.

Note 3: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 4: The full load efficiency should be in $\pm 2\%$ of the typical value in this table. The efficiency is calculated by the way that the full output power is divided by the input power.

Note 5: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.

Input Specifications

Item	Test Condition	Min	Typ.	Max	Unit
Input voltage range	AC input	85	230	305	VAC
	DC input	70	310	430	VDC
Input frequency range	-	47	50	63	Hz
Input current	115VAC	-	-	0.12	A
	277VAC	-	-	0.06	
Surge current	115VAC	-	-	25	A
	277VAC	-	-	40	

Standby power consumption	Input 230VAC	Vo=5V	-	-	0.3	W
		Vo=12V	-	-	0.4	
External fuse	-	1A/300VAC Time-delay fuse, required				
Hot plug	-	NA				
ON/OFF control	-	NA				

Output Specifications

Item		Test Condition		Min	Typ.	Max	Unit
Voltage accuracy		Full input voltage range, 10%~100% load	Vo=5V	-7	±1.5	+3	%
			Vo=12V	-5	±2.5	+8	
Line regulation		Rated load	Vo=5V	-	±1.5	±2.5	
			Vo=12V	-	±1.0	±2.5	
Load regulation		Nominal input voltage, 10%~100% load	Vo=5V	-	±2.5	±5.5	
			Vo=12V	-	±2.0	±5.5	
Ripple & Noise		10%-100% load, 20MHz bandwidth		-	50	150	mVp-p
Dynamic response	Overshoot range	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
	Recovery time			-	-	+5.0	mS
Minimum load		Single Output		10	-	-	%
Temperature drift coefficient		-		-	-	±0.12	%/°C
Turn-on delay time		Input 230VAC (full load)		-	-	1000	mS
Power-off hold up time		Input 230VAC (full load)		-	80	-	
Output overshoot		Full input voltage range		≤10			%Vo
Short circuit protection				Hiccup, Continuous, self-recovery			
Over current protection				110	-	200	%Io

Note: The Ripple and Noise is tested by the Parallel-line method (please refer to the following test instruction).

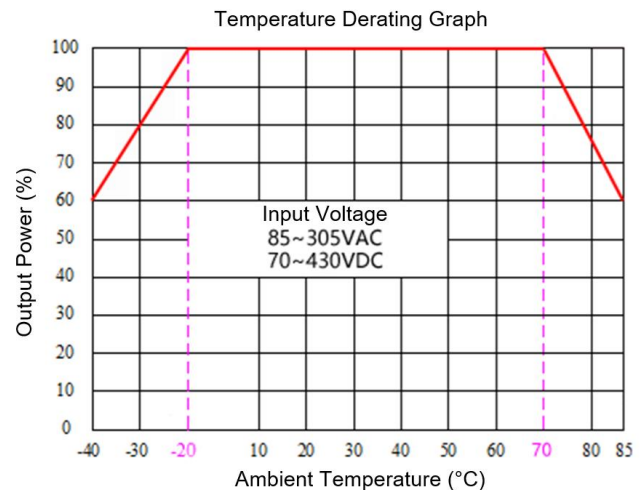
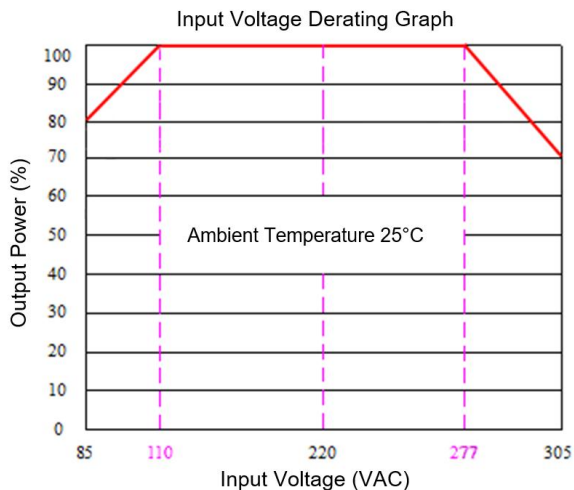
General Specifications

Item	Test Condition		Min	Typ.	Max	Unit
Operating temperature	Refer to the temperature derating graph		-40	-	+85	℃
Storage temperature	-		-40	-	+105	
Soldering temperature	Wave soldering		260±4℃, time 5-10S			
	Manual soldering		360±8℃, time 4-7S			
Relative humidity	-		10	-	90	%RH
MTBF	MIL-HDBK-217F@25℃		1000	-	-	K hours
Vibration	-		10-55Hz,10G, 30 Min, along X, Y, Z			
Case material	-		No case			
Weight & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H			
	A03-C1SXXM	4.5g	19.00x19.70x9.50 mm		0.748×0.776×0.374 inch	
	A03-C1SXXM-1	4.5g	16.20x18.20x9.50 mm		0.638×0.717×0.374 inch	

EMC Performance

Item		Test Standard	Performance/Class
EMC	EMI	CISPR32/EN55032	CLASS A (with the Recommended Circuit 1)
			CLASS B (with the Recommended Circuit 2)
			CLASS A (with the Recommended Circuit 2)
	EMS	RS	IEC/EN61000-4-3 10V/m Perf. Criteria A (with the Recommended Circuit 2)
		CS	IEC/EN61000-4-6 3Vr.m.s Perf. Criteria A (with the Recommended Circuit 2)
		ESD	Contact $\pm 6\text{KV}$ / Air $\pm 8\text{KV}$ Perf. Criteria B (with the Recommended Circuit 1)
		Surge	Line to line $\pm 1\text{KV}$ Perf. Criteria B (with the Recommended Circuit 1)
		EFT	$\pm 2\text{KV}$ Perf. Criteria B (with the Recommended Circuit 1)
			$\pm 4\text{KV}$ Perf. Criteria B (with the Recommended Circuit 2)
		Voltage Dips & Interruptions	IEC/EN61000-4-11 0%~70% Perf. Criteria B (with the Recommended Circuit 2)

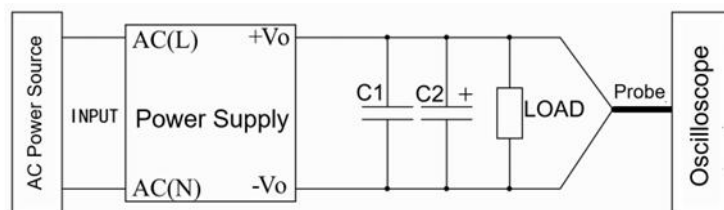
Product Characteristics Graphs



Note 1: The output power should be derated based on the input voltage derating graph at 85~110VAC/70~155VDC & 277~305VAC/390~430VDC.

Note 2: This product should operate under the condition of natural air, please contact us if it could be used at a closed space.

Ripple & Noise Test Instructions (Parallel-line Method, 20MHz Bandwidth)



1. The Ripple & Noise test needs the cables in parallel, an oscilloscope that should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. One polypropylene capacitor C1(0.1uF) and one high frequency low impedance electrolytic capacitor C2(10uF) are connected in parallel with the probe.

2. Refer to the test diagram, the converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The test can start at the converter output terminals after the input power on.

Recommended Circuits for Application

1. Typical application circuit diagram

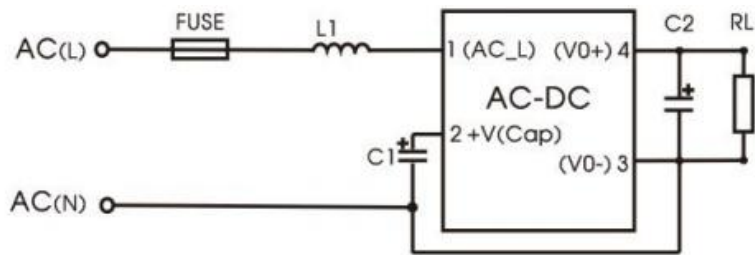


Figure - Circuit 1

FUSE (required)	L1 (required)	C1 (required)	C2 (required)
1A/300VAC, Time-delay fuse	1.2mH/0.2A	10uF/400V (165-265VAC input range)	470uF/16V
		10uF/450V (165-305VAC input range)	
		22uF/400V (85-265VAC input range)	
		22uF/450V (85-305VAC input range)	

Note:

- 1) C1 must be externally connected, a 22uF electrolytic capacitor is recommended to meet the surge level.
- 2) C2 must be externally connected, a high frequency low impedance electrolytic capacitor or a solid-state capacitor is recommended.
- 3) L1 current should be at least 80% of the rated value which is defined by its manufacturer.

2. Recommended circuit diagram for higher EMC requirement

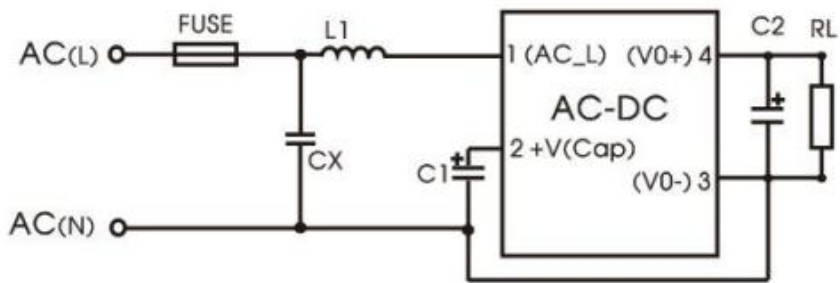
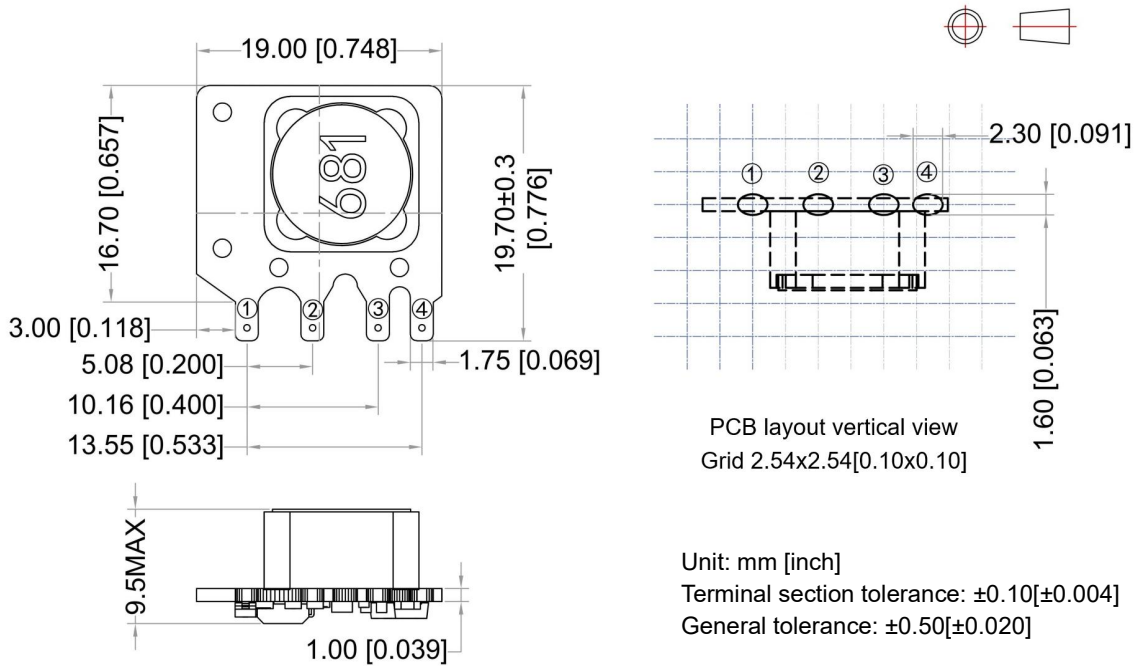


Figure - Circuit 2

FUSE (required)	CX (required)	L1 (required)	C2 (required)	C1 (required)
1A/300VAC, Time-delay fuse	X2/104K/310VAC	1.2mH/0.2A Min	470uF/16V	10uF/400V (165-265VAC input range)
				10uF/450V (165-305VAC input range)
				22uF/400V (85-265VAC input range)
				22uF/450V (85-305VAC input range)

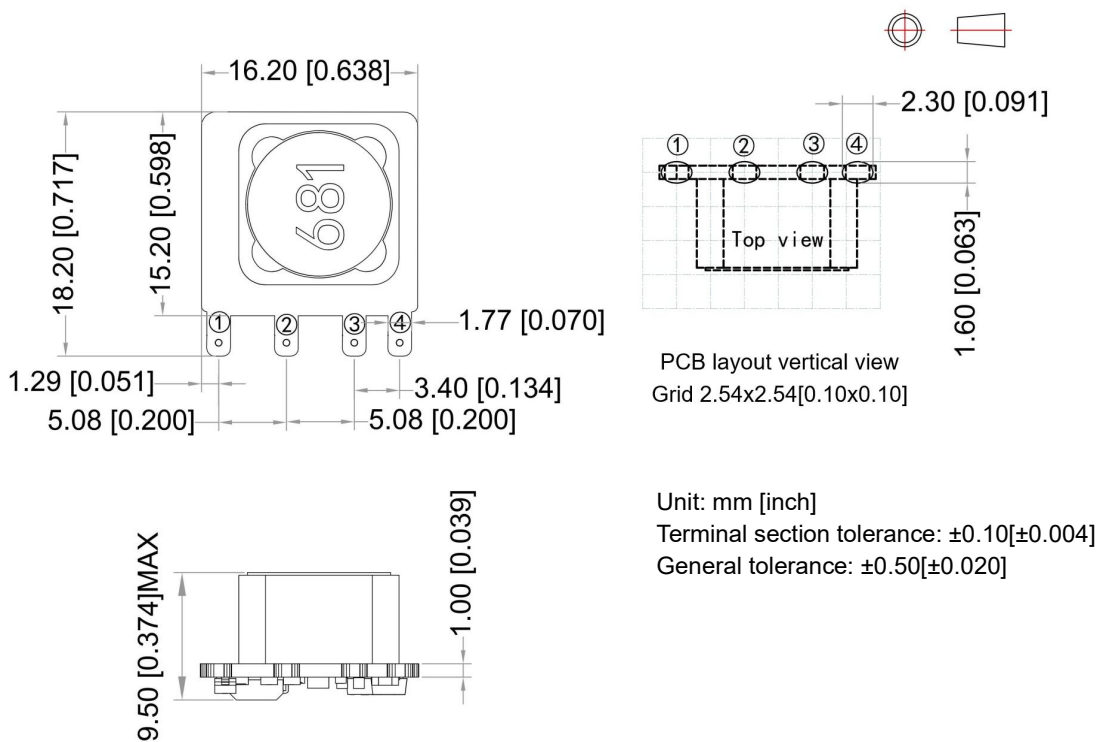
A03-C1SXXM Mechanical Dimensions



Terminal Function Description

Terminal No.	1	2	3	4
Function	AC(L)	+V(Cap)	AC(N)/-Vo	+Vo

A03-C1SXXM-1 Mechanical Dimensions



Terminal Function Description

Terminal No.	1	2	3	4
Function	AC(L)	+V(Cap)	AC(N)/-Vo	+Vo

Application Notice

1. The product should be used according to the specifications, otherwise it could be permanently damaged.
2. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.
3. The product performance cannot be guaranteed if it works under over-load condition.
4. Unless otherwise specified, all values or indicators on this datasheet are tested at Ta=25℃, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
5. All values or indicators on this datasheet have been tested based on Aipupower test specifications.
6. The specifications are specially for the parts listed on this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
7. Aipupower can provide customization service.

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