

Typical Features

- ◆ Wide input voltage range 85-265VAC/120-380VDC
- ◆ No load power consumption $\leq 0.2\text{W}@220\text{VAC}$
- ◆ Efficiency up to 80% (Typ.)
- ◆ Operating temperature from -40 to +85°C
- ◆ Switching frequency 65KHz
- ◆ Output short circuit & over current protections
- ◆ Isolation voltage 3000VAC
- ◆ Altitude during operation 4000m Max
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ Enclosed plastic case, flame class UL94-V0



Application Field

FA5-220SXXG2N3 Series --- Compact size & high-performance modular power supplies with global adapted input voltage range (both AC and DC available), low ripple, low temperature rise, low standby power consumption, high efficiency, high reliability, safety isolated & good EMC performance. This series of products can be widely used in the fields of Electric power, Industry, Instrument and Smart home devices, etc. Additional EMC circuit diagram is recommended for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Input Voltage Range		Output Specifications			Max Capacitive Load @220VAC uF	Ripple & Noise 20MHz (Max) mVp-p	Efficiency @Full load 220VAC (Typ.) %
		Nominal	Range	Power	Voltage	Current			
		(VAC)	(VAC)	P(W)	Vo (VDC)	Io (mA)			
-	FA5-220S05G2N3	220	85-265	5	5	1000	2000	120	75
-	FA5-220S12G2N3				12	416	1000	120	78
-	FA5-220S24G2N3				24	208	800	150	80

Note 1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 2: 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 3: The Ripple and Noise is tested by the Parallel-line method (please refer to the following test instruction).

Note 4: 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	220	265	VAC
	DC input	120	310	380	VDC
Input frequency range	-	47	50	63	Hz

No load power consumption	Input 115VAC	-	0.15	0.2	W
	Input 220VAC	-			
Input current	Input 115VAC	-	-	0.10	A
	Input 220VAC	-	-	0.06	
Surge current	Input 115VAC	-	-	10	
	Input 220VAC	-	-	20	
Leakage current	-	0.5mA TYP/230VAC/50Hz			
Recommended external fuse	-	1A/250VAC Time-delay fuse			
Hot-plug	-	Unavailable			
ON/OFF Control	-	Unavailable			

Output Specifications

Item		Test Condition	Min	Typ.	Max	Unit
Output voltage accuracy		Input 220VAC	-	±2.0	±3.0	%
Line regulation		Rated load	-	-	±0.5	%
Load regulation		Nominal input voltage, 20%~100% load	-	-	±1.0	%
Minimum load		Single Output	0	-	-	%
Temperature drift coefficient		-	-	-	±0.03	%/°C
Turn-on delay time		Input 115VAC, full load	-	-	500	mS
		Input 220VAC, full load	-	-		
Power-off hold up time		Input 115VAC, full load	-	100	-	mS
		Input 220VAC, full load	-		-	
Dynamic response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-	-	5.0	mS
Output overshoot		Full input voltage range	≤10			%Vo
Short circuit protection			Continuous, self-recovery			Hiccup
Over current protection		Input 220VAC	120%Io	-	220%Io	mA
Ripple & Noise		5%-100% load, 20MHz bandwidth	-	-	150	mVp-p

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

General Specifications

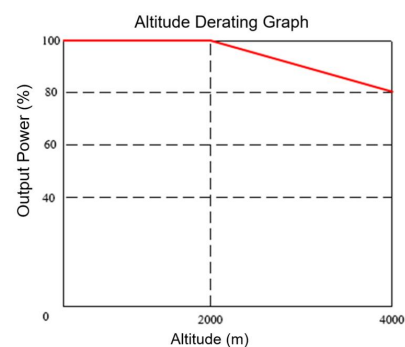
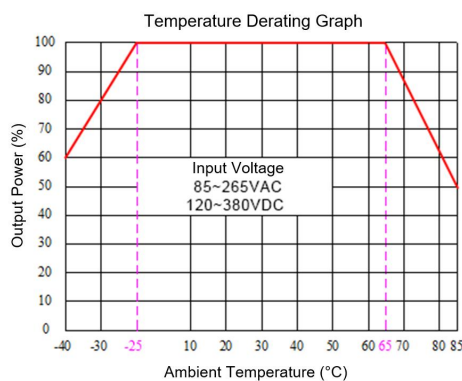
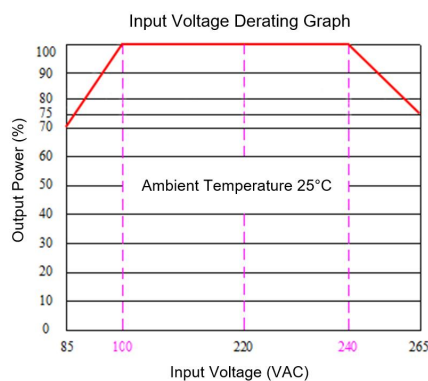
Item	Test Condition		Min	Typ.	Max	Unit
Switching frequency	-		-	65	-	KHz
Operating temperature	Refer to the temperature derating graph		-40	-	+85	℃
Storage temperature	-		-40	-	+105	
Soldering temperature	Wave soldering		260±4℃, time 5-10S			
	Manual soldering		360±8℃, time 4-7S			
Relative humidity	-		10	-	90	%RH
Isolation voltage	I/P-O/P	Test 1min, leakage current <5mA	3000	-	-	VAC
Insulation resistance	I/P-O/P	@ DC500V	100	-	-	MΩ

MTBF	MIL-HDBK-217F@25°C	300	-	-	K Hours
Safety standard	-	IEC/EN62368			
Vibration	-	10-55Hz, 10G, 30 Min, along X, Y, Z			
Safety class	-	CLASS II			
Case flame class	-	UL94-V0			
Weight & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H		
	FA5-220SXXG2N3	30g	39.50X24.50X19.00 mm	1.555X0.965X0.748 inch	

EMC Performance

Total Item	Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032
		RE	CISPR32/EN55032
	EMS	RS	IEC/EN61000-4-3
		CS	IEC/EN61000-4-6
		ESD	IEC/EN61000-4-2
		Surge	IEC/EN61000-4-5
		EFT	IEC/EN61000-4-4
		Voltage Dips & Interruptions	IEC/EN61000-4-11

Product Characteristics Graphs



Note 1: The output power should be derated based on the input voltage derating graph at 85~100VAC/120~140VDC & 240~265VAC/ 340~380VDC.

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

Recommended Circuit Diagram for Application

1. Typical application circuit diagram

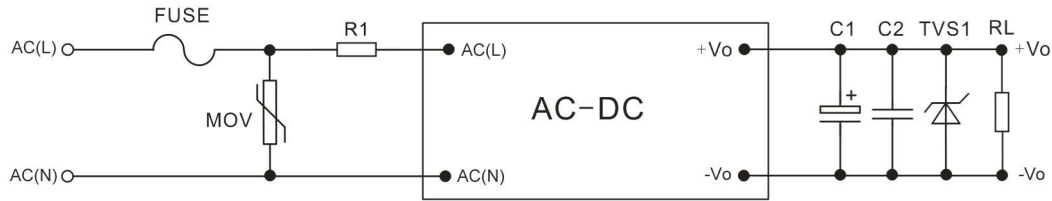


Figure – Circuit 1

Part No.	C1	C2	FUSE (required)	MOV	R1	TVS1
FA5-220S05G2N3	330uF/10V	1uF/50V	1A/250VAC Time-delay fuse	10D511K/ 3500A	2W/10Ω Wire-wound resistor	SMBJ7.0A
FA5-220S12G2N3	220uF/16V					SMBJ20A
FA5-220S24G2N3	100uF/35V					SMBJ30A

Note: A High frequency low impedance electrolytic capacitor is recommended for C1 which capacitance and current should be referred to its manufacturer's specification. A ceramic capacitor is recommended for C2 to suppress the high frequency noise. TVS is used to protect the output circuit under abnormal condition.

2. Recommended EMC circuit diagram for high EMC requirement

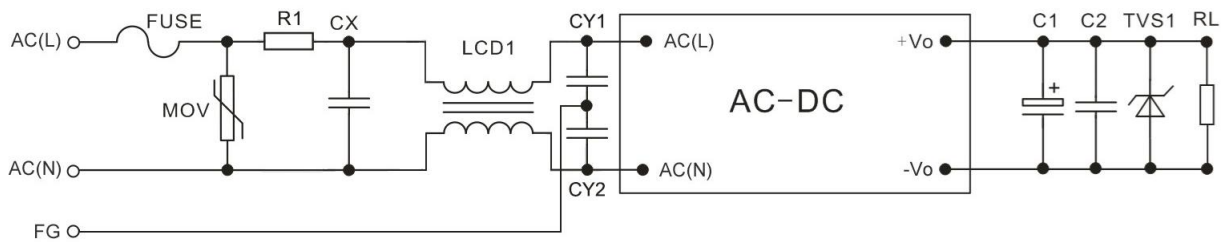
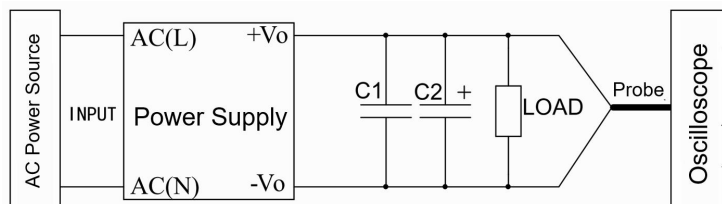


Figure – Circuit 2

Component	Recommended values	Component	Recommended values
MOV	10D511K/3500A	R1	2W/10Ω wire-wound resistor
CX	X2/104K/275VAC	LCD1	UU9.8/25mH/0.2A
FUSE	1A/250VAC, time-delay fuse, required	CY1, CY2	Y1/102M/400VAC

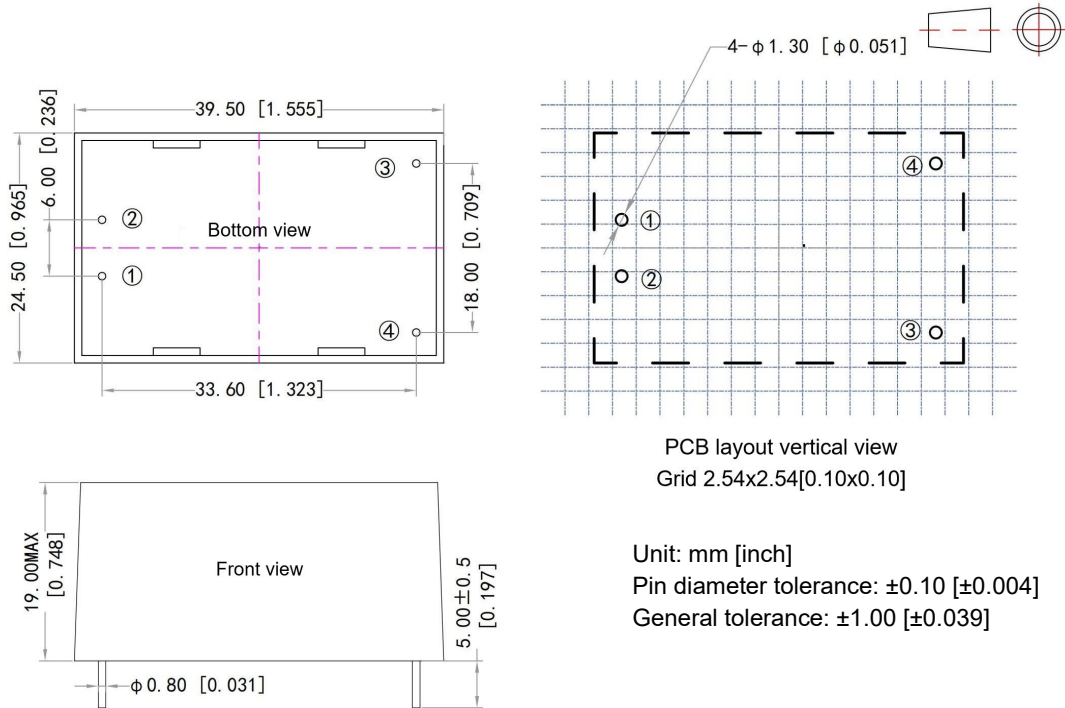
Note: The other components C1/C2/TVS1 should refer to the typical application circuit recommendation.

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



- 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.
- 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.

Mechanical Dimensions



Pin-out Function Description

Pin No.	1	2	3	4
Function	AC(N)	AC(L)	+Vo	-Vo

Application Notice

- 1.The product should be used according to the specification, 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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