AC/DC Converter
FA5-220DXXC2N4 Series

Typical Features

- ◆ Wide input voltage range: 85-305VAC/120-430VDC
- ◆ No load power consumption≤0.25W
- ◆ Transfer efficiency (typ.74%)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over-current
- ◆ Isolation voltage:4000Vac
- ◆ Conform to IEC62368/UL62368/EN62368 test standard
- ◆ PCB mounting

Application Field

FA5-220DXXC2N4 Series *-----is a small size, high efficiency module power supply provided by Aipu to customers. This series of power supplies has the advantages of global input voltage range, AC/DC dual use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, high safety isolation, and good EMC performance. EMC and safety specifications meet the international EN55032 and IEC/EN61000 standards. This series of products are widely used in many fields such as power, industry, instrumentation and smart home. When the product is used in an environment with relatively harsh electromagnetic compatibility, please refer to the application circuit provided by our company.*

Typical Product List

Certificate	Part No.	Output Specification					Max. Capacitive Load	Ripple & Noise 20MHz (Max)	Efficiency @full load 220Vac (TYP)
		Power	Voltage 1	Current 1	Voltage 2	Current 2			
		（W）	Vo1（V）	Io1（m A）	Vo2（V）	Io2（m A）	u F	mVp-p	%
/	FA5-220D05C2N4	5	+5	500	-5	500	2000/1000	100/100	74
	FA5-220D12C2N4	5	+12	208	-12	208	1000/600	120/120	76
	FA5-220D15C2N4	5	+15	167	-15	167	800/470	120/120	78
	FA5-220D24C2N4	5	+24	104	-24	104	500/200	150/150	80

Note 1: Due to limited space, the above is only a partial list of products. If you need products other than those listed, please contact our sales department.

Note 2: The typical value of output efficiency is based on the product being aged at full load for half an hour.

Note 3: The full load efficiency (%, TYP) in the table fluctuates by ±2%. The full load efficiency is the total output power divided by the input power of the module.

Input Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Input Voltage Range	AC input	85	220	305	VAC
	DC input	120	310	430	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	115VAC	-	-	0.12	A
	220VAC	-	-	0.08	

Surge Current	115VAC	-	-	10	
	220VAC	-	-	20	
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
External Fuse Recommended Value	-	1A-2A/250VAC slow-fusing			
Hot-plug	-	unavailable			
Remote Control Terminal	-	unavailable			

Output Specifications

Item		Operating Condition		Min	Typ.	Max	Unit
Voltage Accuracy		Full input voltage range, any load	Vo1	-	±2.0	±3.0	%
			Vo2	-	±2.0	±5.0	
Line Regulation		Nominal load	Vo1	-	-	±0.5	%
			Vo2	-	-	±1.0	
Load Regulation		Nominal input voltage 20%~100% load	Vo1	-	-	±1.0	%
			Vo2	-	-	±4.0	
No Load Power Consumption		Input 115VAC		-	-	0.25	W
		Input 220VAC		-	-		
Minimum Load		Single Output		10	-	-	%
Start-up Delay Time		Nominal input voltage (full load)		-	2000	-	mS
Power-off Holding Time		Input 115VAC (full load)		-	50	-	mS
		Input 220VAC (full load)		-	100	-	
Dynamic Response	Overshoot Amplitude	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
	Recovery Time			-	5.0	-	mS
Output Overshoot		Full input voltage range		≤10%Vo			%
Short Circuit Protection				Continuous, Self-recovery			Hiccup
Temperature Coefficient		-		-	±0.03%	-	%/℃
Over Current Protection		Input 220VAC		≥130% Io self-recovery			Hiccup
Ripple & Noise		Full input voltage range		-	50	150	mV
		Note: The ripple and noise test method adopts the twisted pair test method. The specific test method and matching can be seen later (Ripple & Noise Test Instructions).					

General Specifications

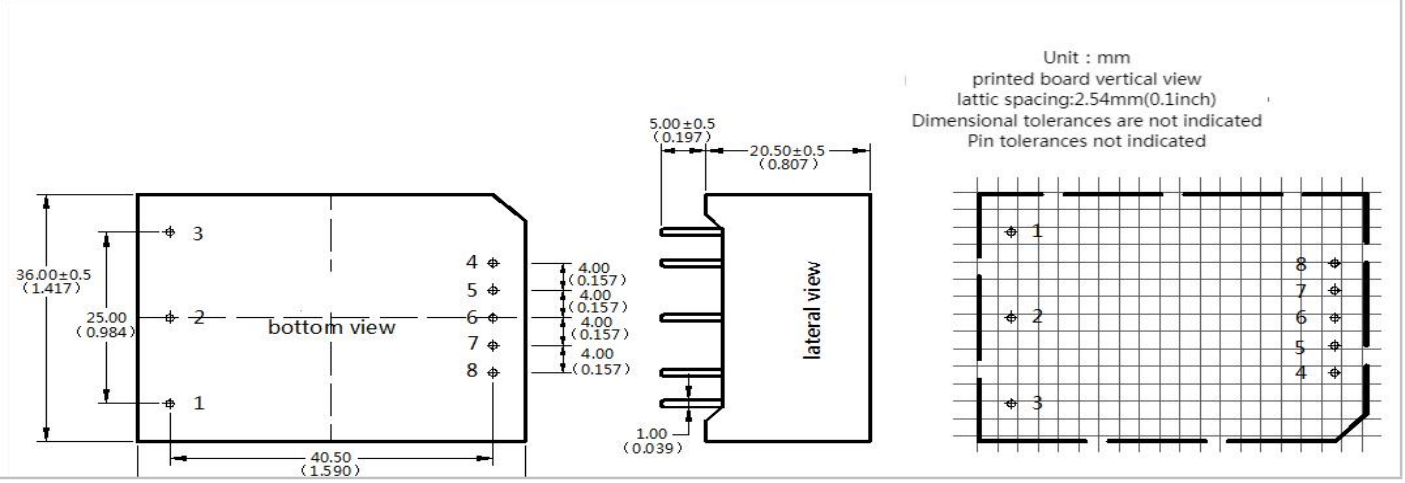
Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+85	℃
Storage Temperature	-	-40	-	+90	

Soldering Temperature		Wave-soldering	260±4℃, timing 5-10S			
		Manual-soldering	360±8℃, timing 4-7S			
Relative Humidity		-	10	-	90	%RH
Isolation Voltage	I/P-O/P	Test 1min, leakage current≤5mA	4000	-	-	VAC
	I/P-Case		-	-	-	VAC
	I/P-FG		2500	-	-	VAC
Insulation Resistor	I/P-O/P	@DC500V	100	-		MΩ
Safety Standard		-	EN62368, IEC62368			
Vibration		-	10-55Hz,10G,30Min, along X,Y,Z			
Safety Class		-	CLASS Ⅱ			
Class of Case Material		-	UL94 V-0			
MTBF		-	MIL-HDBK-217F@25℃＞300,000H			

EMC Characteristics

Total Item		Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (Recommend Circuit 2)
		RE	CISPR22/EN55032	CLASS B (Recommend Circuit 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (Recommend Circuit 2)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (Recommend Circuit 2)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B (Recommend Circuit 2)
		Surge	IEC/EN61000-4-5	line to line ±2KV / line to ground ±4KV Perf.Criteria B (Recommend Circuit 2)
		EFT	IEC/EN61000-4-4	±4KV Perf.Criteria B (Recommend Circuit 2)
		Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B

Packing Dimension



Packing Code	L x W x H	
-	48.5 x 36.0 x 20.5 mm	1.909 × 1.417 × 0.807inch

Pin Definition

Pin	1	2	3	4	6	8
Single(S)	FG	AC（N）	AC（L）	+Vo	COM	-Vo

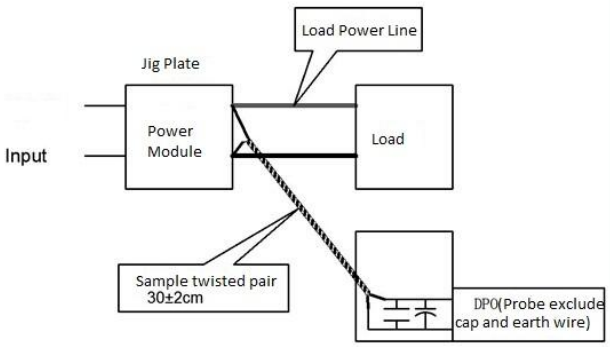
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

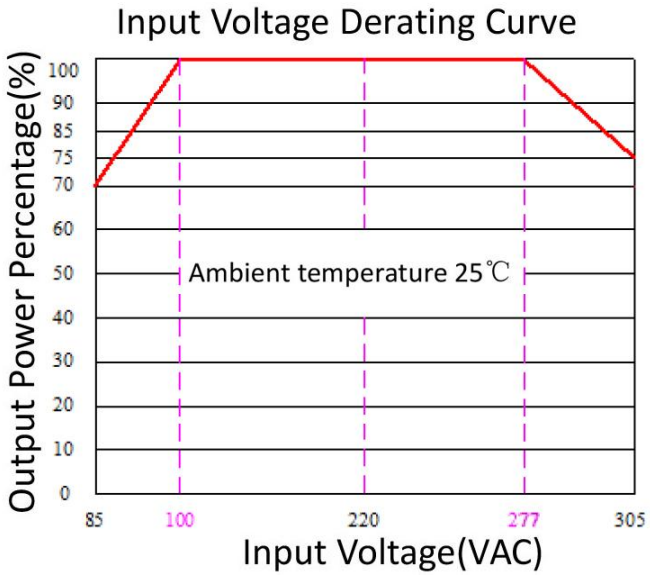
Test Method:

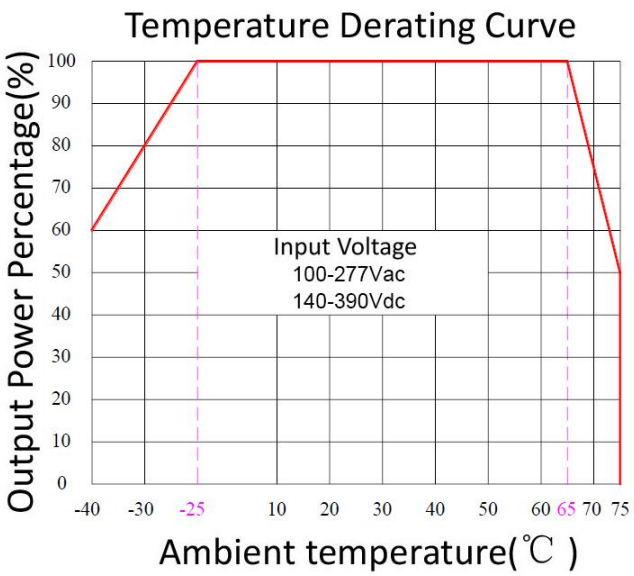
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve



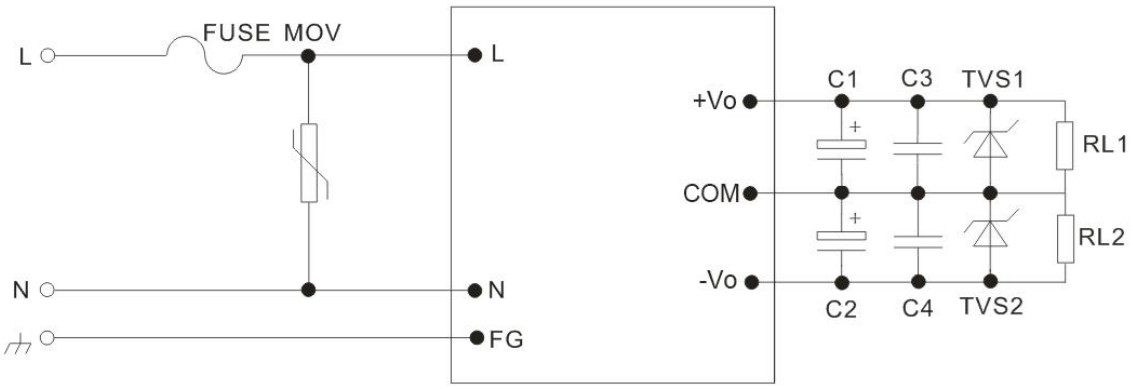


Note 1: Input Voltage should be derated based on input voltage derating curve when it is 85~100VAC/277~305VAC/120~140VDC/ 390~430VDC.

Note 2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

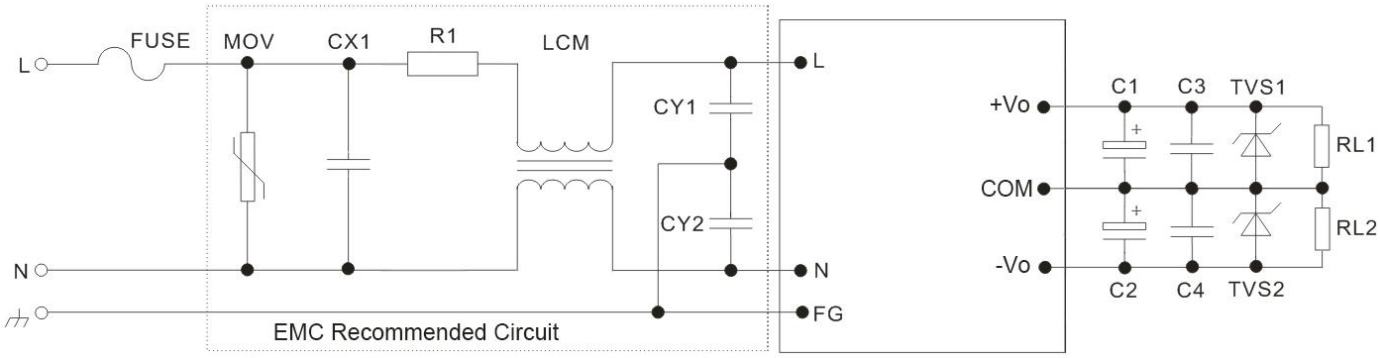
Typical EMC Recommended Circuit:

1. Typical application circuit



Recommended Circuit 1

2. EMC recommended circuit (used under conditions with high EMC requirements)



Recommended Circuit 2

FUSE	Recommended value1A, 250Vac(necessary)	CY1，CY2	1nF/400VAC	TVS1，TVS2	See Note 1 for details
MOV	14D561K	C1，C2	See Note 1 for details		
CX1	0.22uF/275Vac	C3，C4	0.1uF/50V		
LCM	15mH-30mH,0.5A	R1	6.8Ω/2W, wirewound resistors		

Note 1:

1) C1, C2 select high-frequency low-impedance electrolytic capacitors with a capacitance value smaller than the capacitive load capacitance value, and the withstand voltage value is more than 1.5 times the output voltage;

2) C3, C4 select 0.1uF ceramic chip capacitors, and the withstand voltage value is more than 1.5 times the output voltage;

3) TVS1, TVS2 are TVS tubes; 5V output recommended: SMBJ7.0A, 9V output recommended: SMBJ12.0A, 12V output recommended: SMBJ20A,

15V output recommended: SMBJ20.0A, 24V output recommended: SMBJ30.0A, 48V output recommended: SMBJ64A.

Note:

1. The product should be used within the specification range, or it will cause permanent damage to it;
2. The input terminal should connect to fuse;
3. If the product is operated under the minimum load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
4. If the product is worked beyond the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
5. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load(pure resistance load);
6. All index testing methods in this datasheet are based on our Company's corporate standards;
7. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, please directly contact our technician for specific information;
8. We can provide product customization service,
9. Specifications are subject to change without prior notice.

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