Typical Features

- ◆ Wide input voltage range: 85-305VAC/120-430VDC
- ◆ No load power consumption≤0.3W (typ.)
- ◆ Transfer Efficiency (Typical 75%)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over current, over temperature
- ◆ Isolation voltage:3000Vac
- ◆ Meet IEC62368/UL62368/EN62368 test standard
- ◆ Pass UL, FCC, CE, RoHS certificate
- ◆ Plastic case, meet UL94 V-0 class
- ◆ PCB mounting

Application Field

FA2-220SXXN2 Series *-----a compact size, high efficient, pass UL, FCC, CE, RoHS standard power module offered by Aipu. It features universal input voltage range, AC and DC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation, good EMC performance. EMC and Safety standard meet international EN55032,IEC/EN61000. These series have important application for power, industry, instrument and smart home field. For harsh EMC environment, our recommended application circuit is highly recommended.*

Typical Product List

Certificate	Part No.	Output Specifications			Max. Capacitive Load	Ripple& Noise 20MHz (Max)	Efficiency@ Full Load, 220Vac (Typical)
		Power	Voltage	Current			
		(W)	Vo(V)	Io(m A)	u F	mVp-p	%
-	FA2-220S3V3N2	2	3.3	600	700	120	68
UL/FCC/CE/RoHS	FA2-220S05N2	2	5	400	900	120	70
-	FA2-220S12N2	2	12	167	100	150	75
-	FA2-220S24N2	2	24	83	47	150	78

Note 1: Due to space limitations, above is only a part of our product list, please contact our sales team for more items.

Note 2: The typical value of output efficiency is based on module is full loaded and burned-in after half an hour.

Note 3: The fluctuation range of full load efficiency(%,TYP) in table is ±2%, full load efficiency= output power/module's input power.

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	/	/	0.06	A
	220VAC	/	/	0.04	
Surge Current	115VAC	/	/	10	
	220VAC	/	/	20	
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
Recommended External Input Fuse	-	1A-2A/250VAC slow fusing			
Hot Plug	-	Unavailable			
Remote Control Terminal	-	Unavailable			

Output Specifications

Item	Operating Condition		Min	Typ.	Max	Unit
Voltage Accuracy	Input voltage 220V, any load	Vo	-	-	±5.0	%
Line Regulation	Nominal load	Vo	-	-	±1.0	%
Load Regulation	Nominal input voltage, 20%~100% load	Vo	-	-	±5.0	%
No Load Consumption	Input 115VAC		-	0.1	0.3	W
	Input 220VAC		-			
Minimum Load	Single Output		10	-	-	%
Start up Delay Time	Nominal input voltage (full load)		-	200	-	mS
Power-off Holding Time	Input 220VAC (full load)		- -	70	- -	mS
Dynamic Response	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
			-5.0	-	+5.0	mS
Output Overshoot	Full input voltage range		≤10%Vo			%
Short circuit Protection			Continuous, self-recovery			Hiccup
Temperature Drift	-		-	±0.03%	-	%/℃
Over Current Protection	Input 220VAC		≥120% Io self-recovery			Hiccup
Ripple &Noise	Input 220VAC（full load）		50	80	120	mV
	Note: Ripple & Noise is tested by twisted pair method, details please refer to Ripple & Noise test at back.					

General Specifications

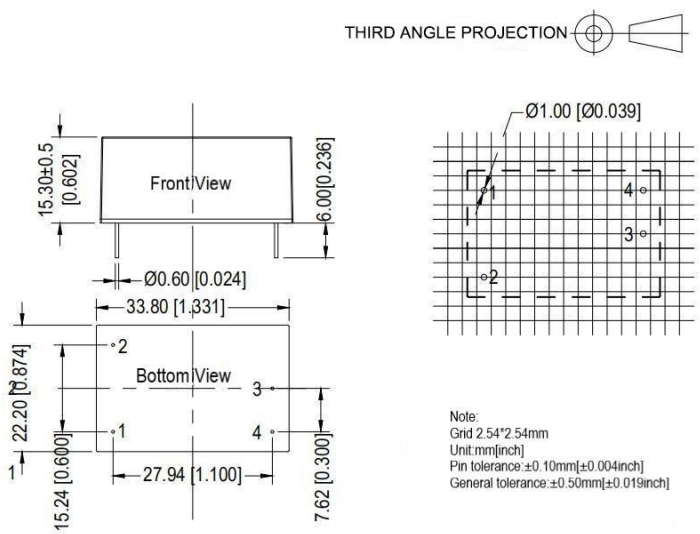
Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+75	℃
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave soldering	260±4℃, time 5-10S			

	Manual soldering	360±8℃, time 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	Input-Output Test 1min, leakage current≤5mA	3000	-	-	VAC
Insulation Resistance	Input-Output@ DC500V	100	-	-	MΩ
Safety Standard	-	EN62368、IEC62368			
Vibration	-	10-55Hz,10G,30Min,along X,Y,Z			
Safety Standard	-	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
		RE	CISPR22/EN55032	CLASS B
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B (see recommended circuit photo 2)
		Surge	IEC/EN61000-4-5	±1KV Perf.Criteria B (see recommended circuit photo 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (see recommended circuit photo 2)
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

Dimension



Packing Code	L x W x H	
N2	33.8X22.2X15.3mm	1.331X0.874X0.602inch

Pin Definition

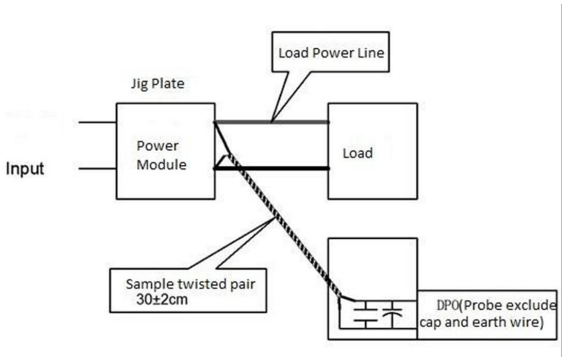
Pin	1	2	3	4
Single(s)	AC(N)	AC(L)	+Vo	-Vo

Ripple& Noise Test :(Twisted Pair Method 20MHZbandwidth)

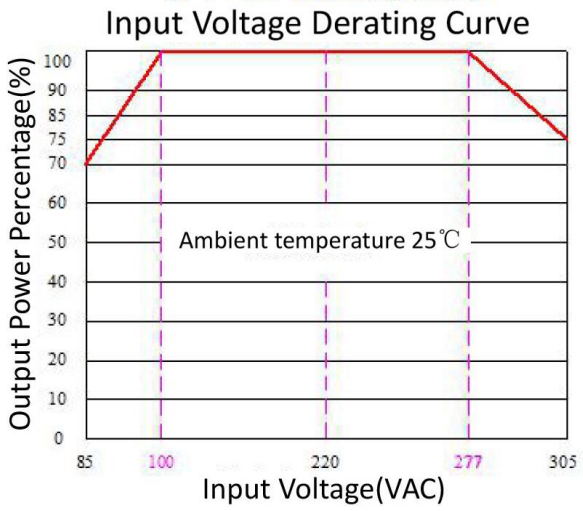
Test Method:

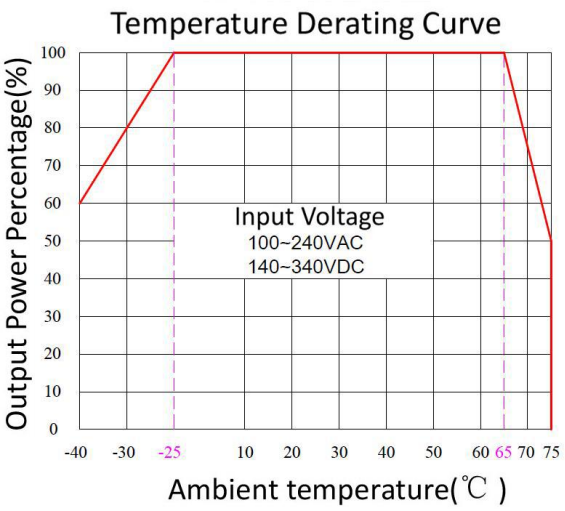
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(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/120~140VDC and 277~305VAC/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 Application Circuit and EMC Recommended Circuit

1. Typical Application Circuit

Photo 1

Output Voltage	3V3 5V	9V	12V 13V	15V	24V	48V
TVS recommend value	SMBJ7.0A	SMBJ12A	SMBJ20A	SMBJ20A	SMBJ30A	SMBJ64A
C1 recommend value	330uF/10V	220uF/16V	220uF/16V	100uF/25V	47uF/35V	22uF/63V

Note:

The output filter capacitor C1 is an electrolytic capacitor, recommended to use high-frequency, low-resistance ones. For capacity and flowing current, please refer to the technical specifications provided by each manufacturer.

C2 is a ceramic capacitor to remove high-frequency noise.

The TVS tube protects the downstream circuit when the module is abnormal and is recommended to be used.

It is recommended to connect an external FUS, model: 1A/250V slow blow.

It is recommended to connect an external RS1 wire-wound resistor, model: 2W, 20Ω.

It is recommended to connect an external MOV varistor, model: 10D561K.

2. ECM Recommended Circuit

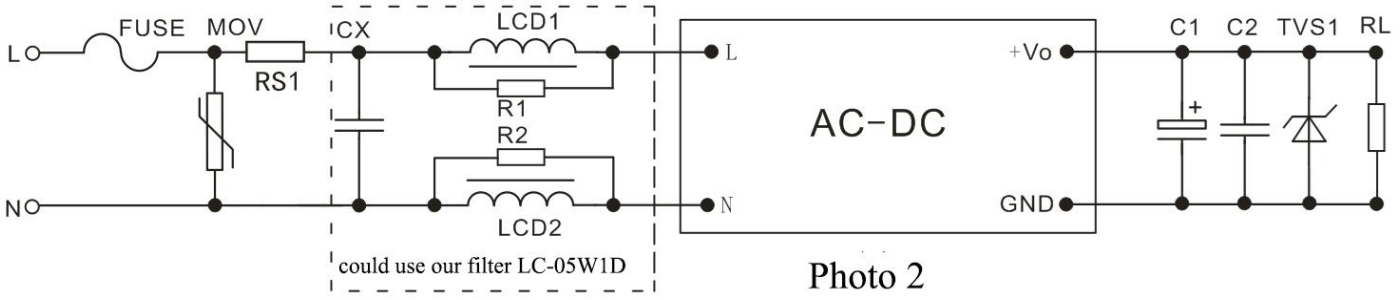


Photo 2

Components	Recommended Value	Components	Recommended Value
MOV	10D561K	RS1	2W,20Ω
CX	0.1uF/275VAC	LMD	1mH/1W color ring inductor
FUSE	1A/250V,slow fusing, necessary	-	-
R1、R2	2KΩ, 5%, 1/8W以上	-	-

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 worked under the minimum requested load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
4. If the product is not operated within 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, please follow up with our website for newest manual.

Guangzhou Aipu Electron Technology Co., Ltd
Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China.
Tel: 86-20-84206763 Fax: 86-20-84206762 HOTLINE: 400-889-8821
E-mail: sales@aipu-elec.com Website: https://www.aipupower.com