Typical Features

- ◆ Wide input voltage range 85-305VAC/120-430VDC
- ◆ No load power consumption≤0.2W
- ◆ Transfer efficiency 93%(typical)
- ◆ Switching frequency 75KHz
- ◆ Protections: short circuit, over current, over temperature protection
- ◆ Isolation Voltage 4200Vac
- ◆ Conform to IEC62368/UL62368/EN62368 test standard
- ◆ Fully enclosed plastic housing, compliant with UL94V-0
- ◆ PCB mounting

Application Field

FA90-220SXXG2N5 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 comply with 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	Current			
		(W)	Vo(V)	Io(m A)	u F	mVp-p	%
-	FA90-220S12G2N5	80.4	12	6.7	6800	120	92
	FA90-220S24G2N5	90	24	3.75	3000	200	93

Note 1: -T is a wiring package, -TS is a rail package, and the rail width is 35mm;

Note 2: "*" represents a model under development.

Note 3: The typical value of output efficiency is based on the product being aged for half an hour at full load.

Note 4: 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.

Note 5: The test method for ripple and noise adopts the twisted pair test method. For specific test methods and matching, please refer to the following (Ripple & Noise Test Instructions).

Input Specifications

Items	Operating Conditions	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	-	-	2.0	A
	220VAC	-	-	1.1	
Surge Current	115VAC	-	35	-	A
	220VAC	-	65	-	
Leakage Current	-	0.25mA TYP/230VAC/50Hz			
Recommended External Input Fuse	-	3.15A/300VAC, slow-fusing			
Hot Plug	-	Unavailable			
Remote Control Terminal	-	Unavailable			

Output Specifications

Items		Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range, any load	Vo	-	±2.0	±3.0	%
Line Regulation		Nominal load	Vo	-	-	±1.0	%
Load Regulation		Nominal input voltage, 20%~100% load	Vo	-	-	±1.5	%
No Load Power Consumption		Input 115VAC		-	0.2	0.30	W
		Input 220VAC		-	0.2		
Minimum Load		Single Output		-	-	-	%
Start-up Delay Time		Nominal input voltage (full load)		-	1500	-	mS
Power-off Holding Time		Input 115VAC(full load)		-	8	-	mS
		Input 220VAC(full load)		-	65	-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%		-10	-	+10	%
	Recovery time			-	5.0	-	mS
Output Overshoot		Full input voltage range		≤10%Vo			%
Short-Circuit Protection				Continuous, Self-recovery			Hiccup
Drift Coefficient		-		-	±0.03%	-	%/℃
Over-current Protection		Input 220VAC		≥110% Io self-recovery			Hiccup
Over-voltage Protection		Output 12VDC		≤16.0			VDC
		Output 24VDC		≤35.0			

General Specifications

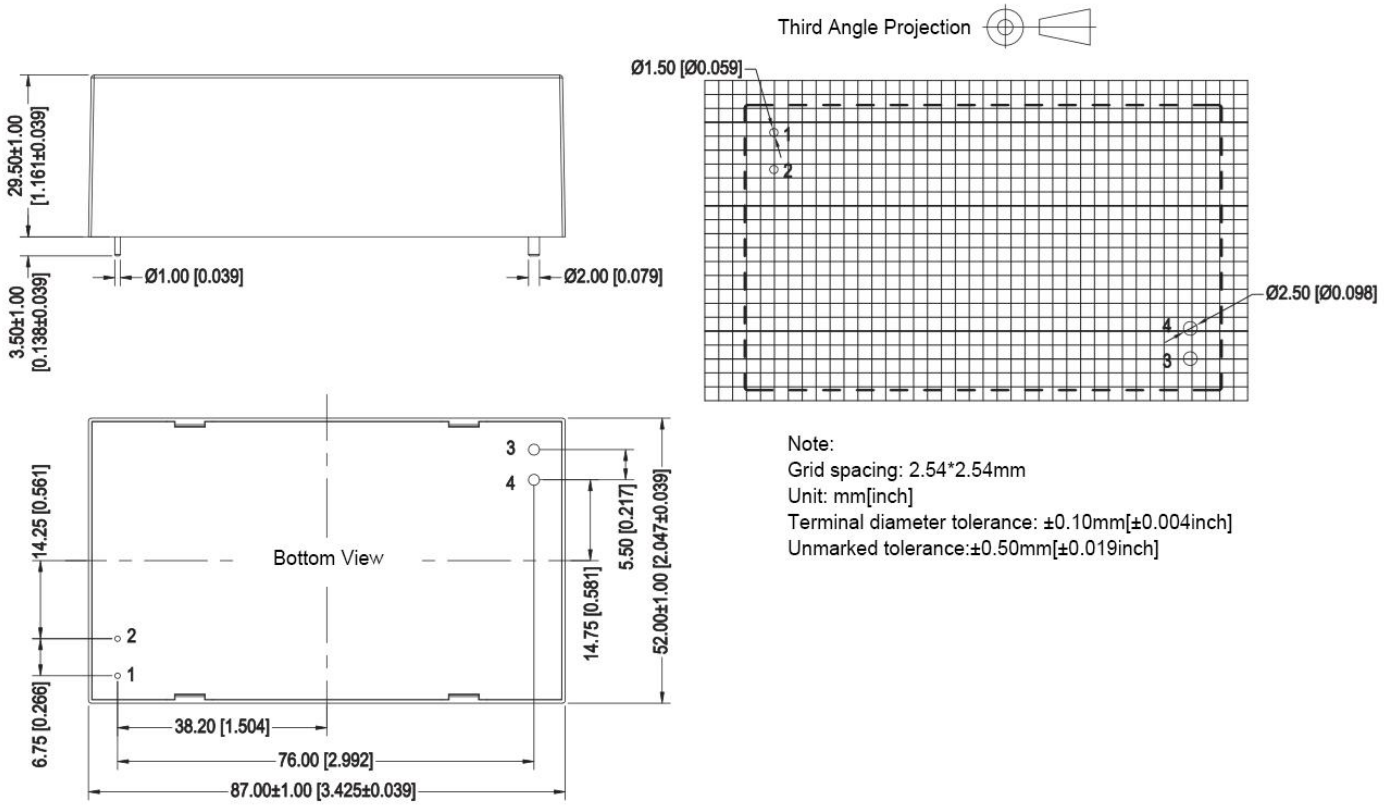
Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	75	-	KHz

Operating Temperature	-	-40	-	+85	℃
Storage Temperature	-	-40	-	+105	
Soldering Temperature	Wave soldering	260±4℃, timing 5-10S			
	Manual soldering	360±8℃, timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	Input-Output, test 1min, leakage current≤5mA	4200	-	-	VAC
Insulation Resistance	Input-Output@DC500V	100	-	-	MΩ
Safety Standard	-	EN62368-1、IEC62368-1			
Vibration	-	10-55Hz,10G,30Min,along X,Y,Z			
Safety Class	-	CLASS Ⅱ			
Shell Class	-	UL94V-0			
MTBF	-	MIL-HDBK-217F@25℃＞300,000H			

Electromagnetic Compatibility(EMC) Characteristics

Total Items		Sub Items	Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (Recommended Circuit 2)
		RE	CISPR22/EN55032	CLASS B (Recommended Circuit 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (Recommended Circuit 2)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (Recommended Circuit 2)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B (Recommended Circuit 2)
		Surge	IEC/EN61000-4-5	line to line ±2KV / line to ground ±4KV Perf.Criteria B (Recommended Circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (Recommended 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	
-	87.00 X 52.00 X 29.50mm	3.425 X 2.047 X 1.161inch

Pin Definition

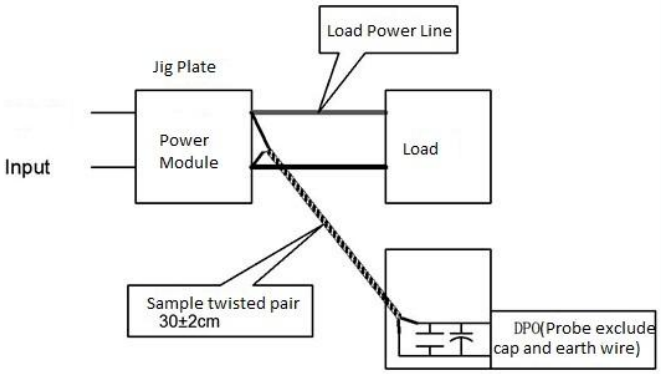
Pin-out	1	2	3	4	5
Single(S)	AC(N)	AC(L)	+Vo	-Vo	NA

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

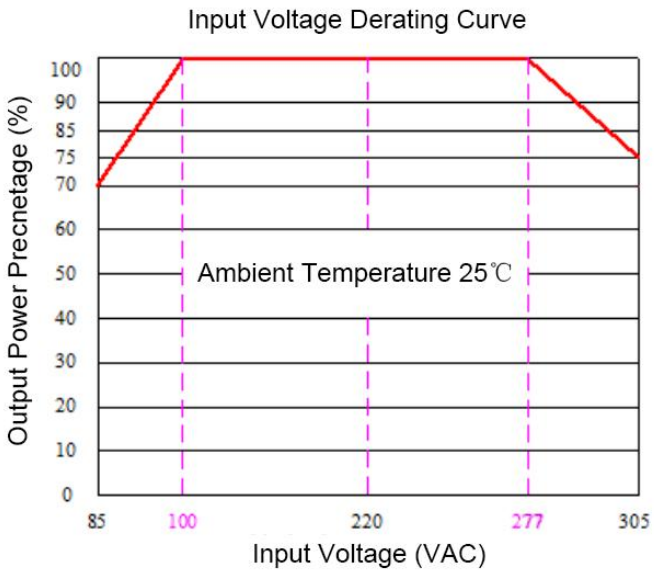
Test Method:

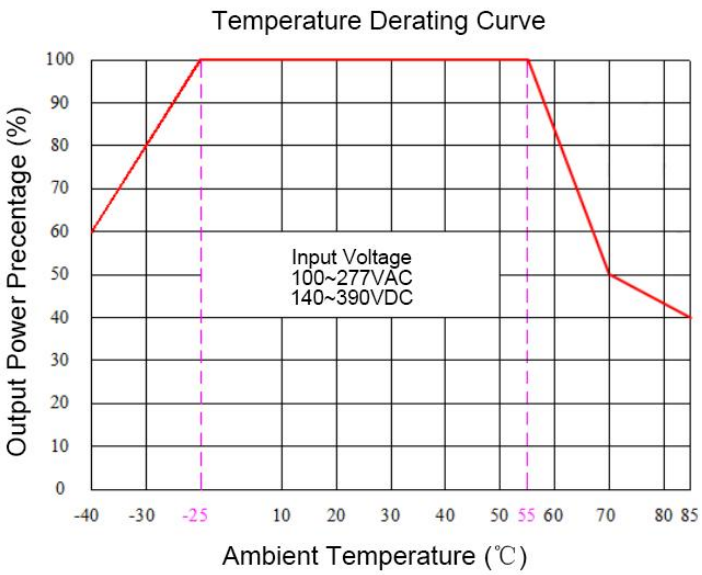
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(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





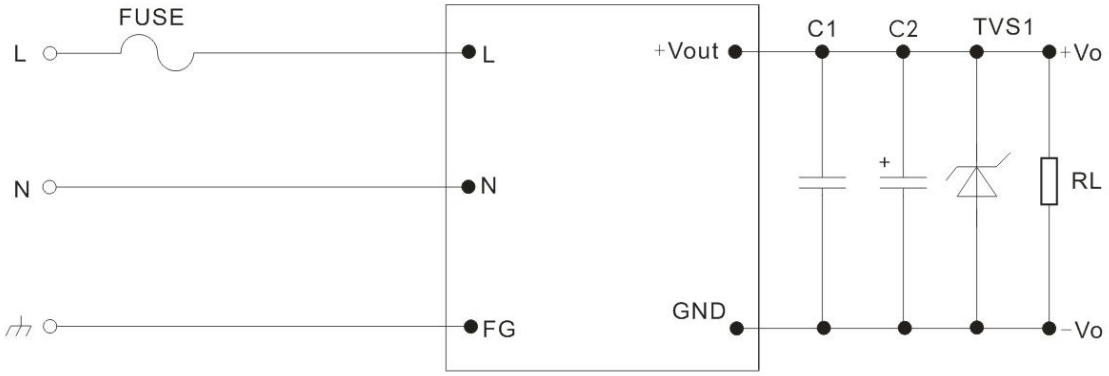
Note

1: Input Voltage should be derated base on Input Voltage Derating Curve when it is 85~100VAC/277~305VAC/120~140VDC/ 390~430VDC.

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 Parameters

1. Typical Application Circuit



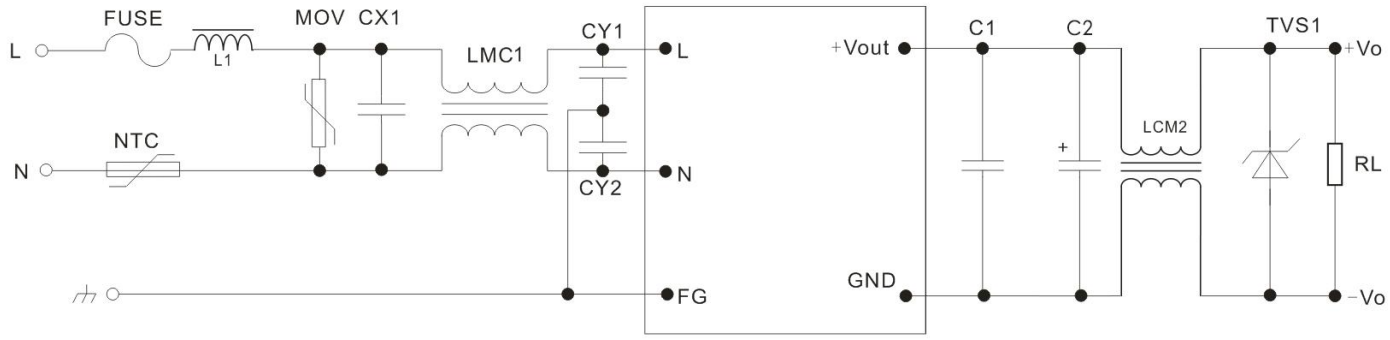
Recommended Circuit 1

Part No.	FUSE	C1	C2	TVS1
FA90-220S12G2N5	3.15A/300V, Slow Fusing	1uF/50V, Ceramic capacitors	330uF/35V	SMBJ20A
FA90-220S24G2N5			200uF/35V	SMBJ30A

Note:

Output capacitor C1 is a ceramic capacitor to remove high-frequency noise. Output filter capacitor C2 is an electrolytic capacitor. It is recommended to use a high-frequency low-resistance electrolytic capacitor. For the capacity and current flowing through, please refer to the technical specifications provided by each manufacturer. TVS tube protects the subsequent circuit when the module is abnormal. It is recommended to use it. It is recommended to connect an external FUSE fuse, model: 3.15A/300V slow break. It is recommended to connect an external MOV varistor, model: 20D561K.

2. EMC Recommended Circuit



Recommended Circuit 2

Component	Recommended Value	Component	Recommended Value
MOV	14D561K	NTC	13D-08
CX1	0.68uF/310VAC	LMC1	UU10.5,25mH
FUSE	6.3A/300V, slow fusing, necessary	LMC2	150uH±20%
CY1、CY2	1nF/400VAC	L1	330uH±10%

Note:

1. The product should be used within the specification range, otherwise it will cause permanent damage to the product;
2. The product input terminal must be connected to a fuse;
3. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
4. If the product works beyond the product load range, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
5. Unless otherwise specified, the above data are measured at Ta=25℃, humidity<75%, input nominal voltage and output rated load (pure resistance load);
6. All the above index test methods are based on our company's standards;
7. The above are the performance indicators of the product models listed in this manual. Some indicators of non-standard model products will exceed the above requirements. For specific circumstances, please contact our technical personnel directly
8. Our company can provide product customization;
9. Product specifications are subject to change without prior notice. Please pay attention to the latest manual published on our official website.

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