



**Typical Features**

- ◆ Wide Input Voltage Range:85-265VAC/120-380VDC
- ◆ No load power consumption ≤0.15W
- ◆ Transfer Efficiency: 88%(typ.)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: Short-circuit, Over-current, Over-voltage
- ◆ Isolation voltage: 4000Vac
- ◆ Meet IEC62368/UL62368/EN62368 test standard
- ◆ With CE, RoHS
- ◆ Pass LPS test
- ◆ Plastic case, meet flammability UL94 V-0
- ◆ PCB Mounting



**Application Field**

**FA20-220SXXP2D4 Series**-----a compact size, high efficient, certified with CE power converter 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, with good EMC performance, meet EN55032, IEC/EN61000 standard. The series widely used for power, industry, instrument, smart home application, etc. The application circuit in the datasheet is strongly recommended for harsh EMC environment.

**Typical Product List**

Certificate	Part No.	Output Specification			Max. Capacitive Load (MAX) uF	Ripple& Noise 20MHz (MAX) mVp-p	Efficiency@ Full Load 220Vac (Typical) %
		Power	Voltage	Current			
		(W)	Vo(V)	Io(m A)			
CE/RoHS	FA20-220S05P2D4	20	+5.0	4000	10000	50	82
CE/RoHS	FA20-220S09P2D4	20	+9	2222	6000	80	83
CE/RoHS	FA20-220S12P2D4	20	+12	1666	5000	80	84
CE/RoHS	FA20-220S15P2D4	20	+15	1333	3000	80	85
CE/RoHS	FA20-220S24P2D4	20	+24	833	2000	100	88

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: ".\*" is model under developing.

Note 3: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.

Note 4: The fluctuation range of full load efficiency(%, TYP) is ±2%, full load output efficiency= total output power/module's input power.

**Input Specifications**

Item	Operating 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
Input Current	100VAC	-	-	0.4	A
	220VAC	-	-	0.25	
Surge Current	100VAC	-	-	10	
	220VAC	-	-	20	
No Load Power Consumption	Input 115VAC	-	0.08	0.1	W
	Input 230VAC	-			
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
External Fuse Recommend Value	-	3.15A-5A/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	-	±1.0	±2.0	%	
Line Regulation	Nominal Load	-	-	±0.5	%	
Load Regulation	Nominal input voltage, 20%~100% load	-	-	±1.0	%	
Minimum Load	Single Output	0	-	-	%	
Turn-on Delay Time	Input 115Vac (full load)	-	500	-	mS	
	Input 220Vac (full load)	-		-		
Power-off Holding Time	Input 115VAC (full load)	-	14	-	mS	
	Input 220VAC (full load)	-	70	-		
Dynamic Response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-5.0	-	+5.0	mS
Output Over-shoot	Full input voltage range	≤10%Vo			%	
Short circuit protection		Continuous, Self-recovery			Hiccup	
Drift Coefficient	-	-	±0.03%	-	%/°C	
Over Current Protection	Input 100-265VAC	≥130% Io Self-recovery			Hiccup	
Over Voltage Protection	Output 5VDC	≤10			VDC	
	Output 12VDC	≤18				
	Output 15VDC	≤20				
	Output 24VDC	≤30				



Ripple & Noise	-	-	80	100	mV
	Note: Ripple& Noise is tested by Twisted Pair Method, details please see Ripple& Noise Test at back.				

**General Specifications**

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+75	°C
	Derating base on Temperature Derating Curve (see product characteristic curve below)				
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave-soldering	260±4°C, timing 5-10S			
	Manual-soldering	360±8°C, timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	Input-Output Test 1min, leakage current≤5mA	4000	-	-	VAC
Insulation Resistance	Input-Output@DC500V	100	-	-	MΩ
Safety Standard	-	EN60950、IEC60950			
Vibration	-	10-55Hz,10G,30Min, alongX,Y,Z			
Safety Class	-	CLASS II			
MTBF	-	MIL-HDBK-217F@25°C>300,000H			

**Material Characteristics**

Case Material	Black flame-retardant heat-resistant plastic (UL94 V-0)				
Packing Dimension	Horizontal package	53.8X28.8X23.5 mm			
Product Weight		50g(TYP.)			
Cooling Method	Natural air cooling				

**EMC Characteristics**

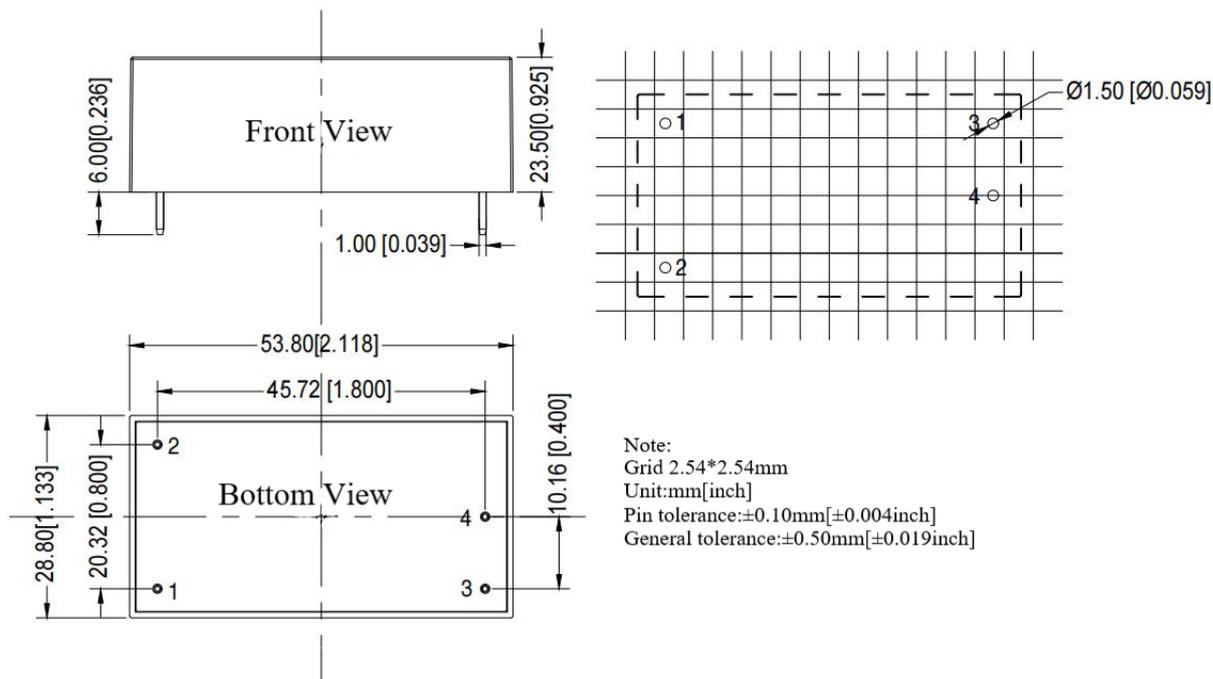
Total Item	Sub Item	Test Standard	Class	
EMC	EMI	CE	CISPR22/EN55032 CLASS B (see recommended circuit Photo 2)	
		RE	CISPR22/EN55032 CLASS B (see recommended circuit Photo 2)	
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (see recommended circuit Photo 1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (see recommended circuit Photo 1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±1KV Perf.Criteria B (Bare board)
±2KV Perf.Criteria B (see recommended circuit Photo 1)				



	EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (see recommended circuit Photo 1)
	Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

**Packing Dimension**

THIRD ANGLE PROJECTION



Packing Code	L x W x H	
P2	53.8X 28.8X23.5 mm	2.118X1.134X0.925inch

**Pin Definition**

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

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

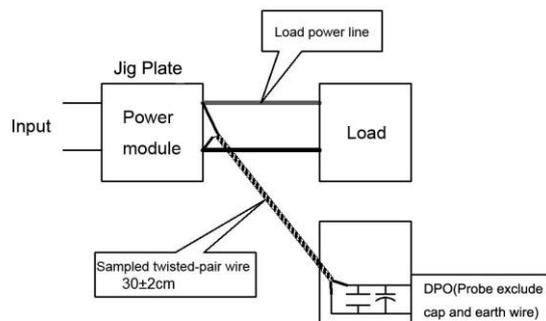
**Ripple & Noise Test: (Twisted Pair Method 20MHZ bandwidth)**

**Test Method:**

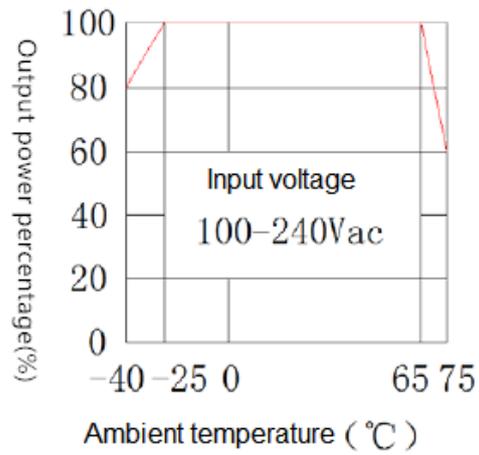
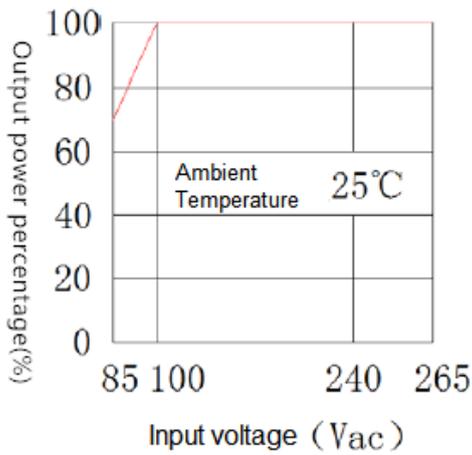
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

**(2) Output Ripple & Noise Test Method:**

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/240~265VAC/120~140VDC/340~380VDC.  
 2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

**Design Reference Application**

**1. Typical Application Circuit**



Photo 1

FUSE	Recommended 2A, 250vac(necessary)	C2	0.1uF/50V	TVS1	24V:SMBJ30.0A
MOV	14D511K	TVS1	5V:SMBJ7.0A	TVS1	48V:SMBJ30.0A
NTC	5D-9	TVS1	9V:SMBJ12.0A	LCM	common mode inductor 180uH
C1	electrolytic capacitor 220uF	TVS1	12V:SMBJ20.0A		

**Note:**  
 1. C1 is output high frequency low impedance filter electrolytic capacitor, it can decrease output ripple. Customer can choose according to their own condition. The withstand voltage is over 1.2 times of output voltage.  
 2. TVS1 is transient voltage absorber, suggested to protect post circuit when the module fails. Please choose the right model per above table.



2. EMC solution recommended circuit (Used under high EMC requirement)

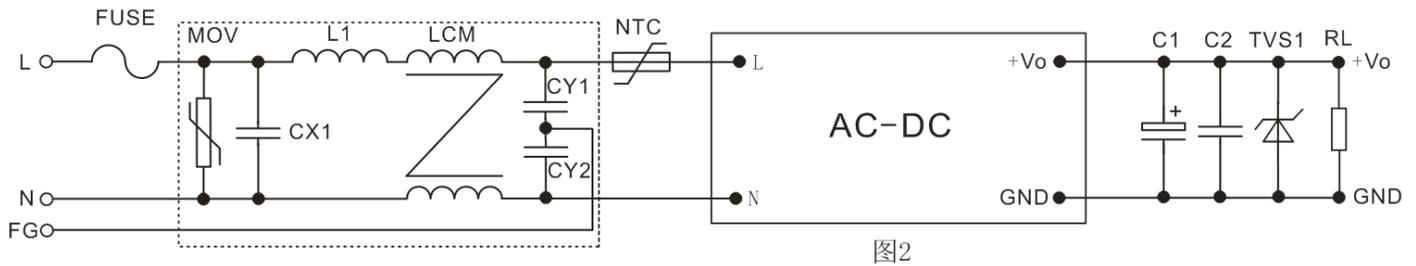


图2

Photo2

FUSE	Recommended 2A, 250vac (necessary)	CY1, CY2	1nF/400VAC
MOV	14D511K	L1	820uH
NTC	5D-9	LCM	15-25mH
CX1	0.1uF/275VAC		

**Note:**

- 1.The product should be used under the specification range, otherwise it will cause permanent damage to it.
- 2.Product's input terminal should connect to fuse;
- 3.If the product operated below the minimum load request, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- 4.If the product worked beyond the load range, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- 5.Unless otherwise specified, data in this datasheet are tested under conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated 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 customized product service;
- 9.The product specification may be changed at any time without prior notice.