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 Test Standard
- ◆ 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)	Ripple& Noise 20MHz (MAX)	Efficiency@ Full Load 220Vac (Typical)
		Power	Voltage	Current			
		(W)	Vo(V)	Io(m A)	uF	mVp-p	%
CE/RoHS	FA20-220S05P2D4	20	+5.0	4000	10000	50	82
CE/RoHS	FA20-220S09P2D4	20	+9.0	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
/	FA20-220S48P2D4	20	+48	416	2000	100	88

Note 1: The fluctuation range of full load efficiency(%,TYP) is ±2%, full load output efficiency= total output power/module's input power.

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

Note 3: Due to space limitations, above is only a part of our product list, please contact our sales team for more items.

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	105VAC	-	-	16	
	230VAC	-	-	28	
No Load Power Consumption	Input 115VAC	-	0.08	0.15	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% 50%~75%~50%	-5.0	-	+5.0	%
	Recovery time		-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%	-	%/℃
Over Current Protection		Input 100-265VAC	≥130% Io Self-recovery			Hiccup
Over Voltage Protection		Output 5VDC	≤10			VDC
		Output 9VDC	≤12			
		Output 12VDC	≤18			
		Output 15VDC	≤20			
		Output 24VDC	≤30			

	Output 48VDC	≤60			
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	℃
	Derating base on Temperature Derating Curve (see product characteristic curve below)				
Storage Temperature	-	-40	-	+85	
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	4000	-	-	VAC
Insulation Resistance	Input-Output@DC500V	100	-	-	MΩ
Safety Standard	-	EN62368、IEC62368			
Vibration	-	10-55Hz,10G,30Min, alongX,Y,Z			
Safety Class	-	CLASS Ⅱ			
Case Class	-	UL94V-0 Class			
MTBF	-	MIL-HDBK-217F@25℃＞300,000H			

Material Characteristics

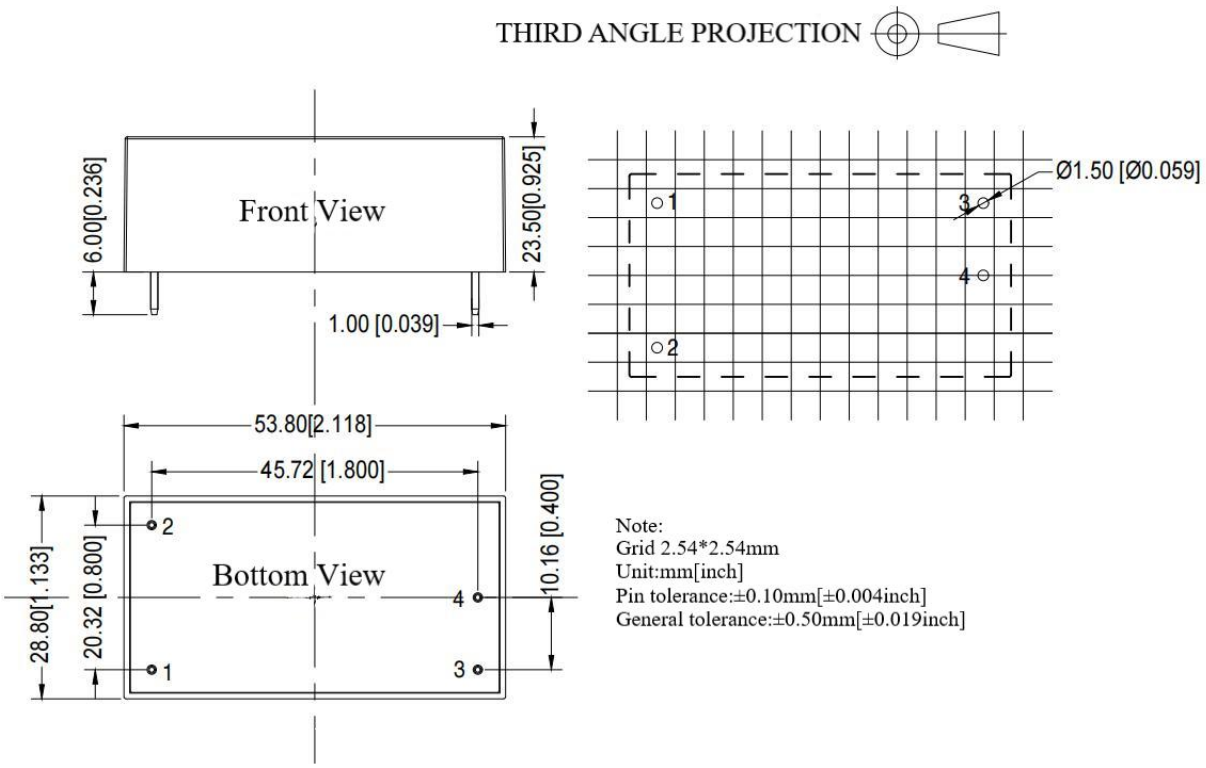
Case Material		Black flame-retardant heat-resistant plastic (UL94 V-0)
Packing Dimension	Horizontal package	53.8X28.8X23.5 mm
Product Weight		50g (TYP.)
Cooling Method		Natural air cooling

EMC Characteristics

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

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

Packing Dimension



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.

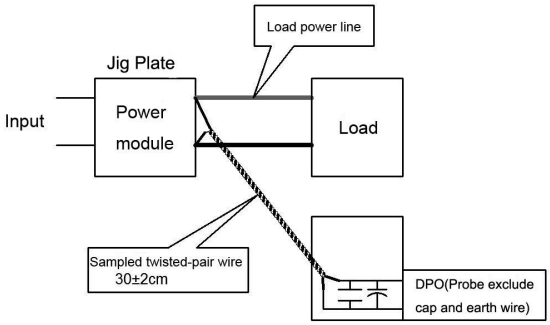
Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

Test Method:

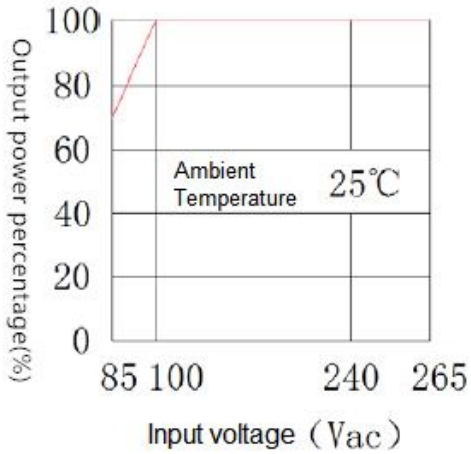
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

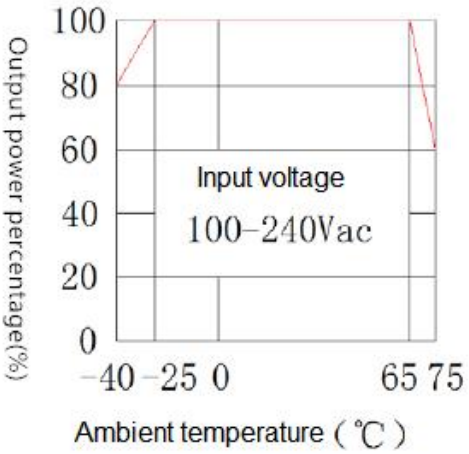
(2)Output Ripple& Noise Test Method:

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





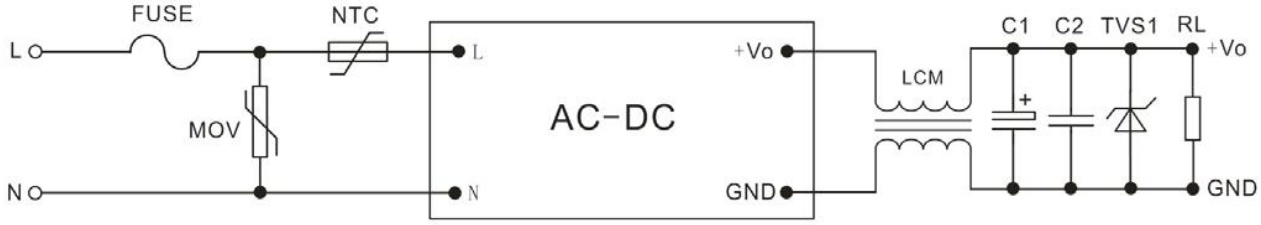
Note

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



Recommended Circuit 1

FUSE	Recommended 2A, 250vac(necessary)	C2	0.1uF/50V	TVS1	24V:SMBJ30.0A
MOV	14D511K	TVS1	5V:SMBJ7.0A	TVS1	48V:SMBJ64.0A
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)

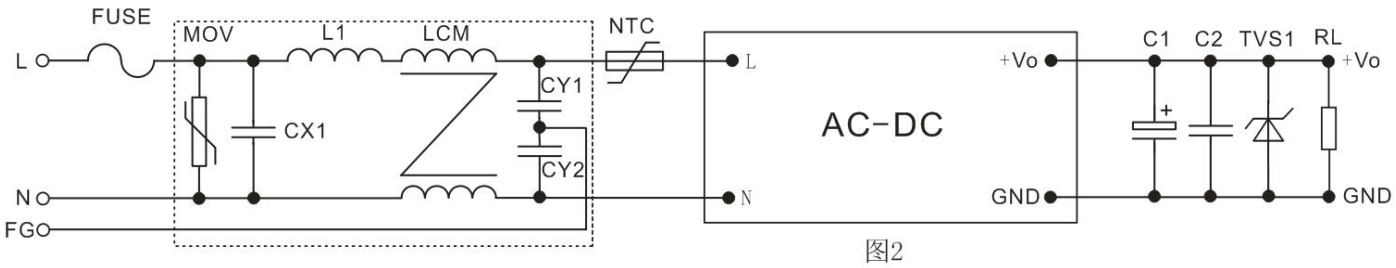


图2

Recommended Circuit 2

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℃, 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.

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