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 IEC60950/UL60950/EN60950 test standard
- ◆ Pass LPS test
- ◆ Plastic case , meet UL94 V-0
- ◆ PCB Mounting

Application Field

FA20-220SXXP2N4 Series**-----***a compact size, high efficient 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

Certification	Part No	Output Specification					Max. Capacitive Load（MAX）	Ripple& noise 20MHz（MAX）	Efficiency @ Full Load，220Vac（Typ）
		Power	Voltage 1	Current 1	Voltage 2	Current 2			
		（W）	Vo1（V）	Io1（mA）	Vo2（V）	Io2（mA）	uF	mVp-p	%
-	FA20-220S05P2N4	20	5.0	4000	--	--	10000	50	82
	*FA20-220S09P2N4	20	9	2222	--	--	6000	80	83
	FA20-220S12P2N4	20	12	1666	--	--	5000	80	84
	*FA20-220S15P2N4	20	15	1333	--	--	3000	80	85
	FA20-220S24P2N4	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	Vo1	-	±1.0	±2.0	%
		Vo2	-	-	-	%
Line Regulation	Nominal Load	Vo1	-	-	±0.5	%
		Vo2	-	-	-	%
Load Regulation	Nominal input voltage,20%~100% load	Vo1	-	-	±1.0	%
		Vo2	-	-	-	%
Minimum Load	Single Output		0	-	-	%
	Dual output common ground		-	-	-	%
	Dual output isolated		-	-	-	
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	25%~50%~25% 50%~75%~50%	Overshoot range（%）：≤±5.0			%
		Recovery time（mS）：≤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 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	℃
	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	-	EN60950、IEC60950			
Vibration	-	10-55Hz,10G,30Min,alongX,Y,Z			
Safety Class	-	CLASS Ⅱ			
Class of Case Material	-	UL94V-0 Class			
MTBF	-	MIL-HDBK-217F@25℃＞300,000H			

Material Characteristics

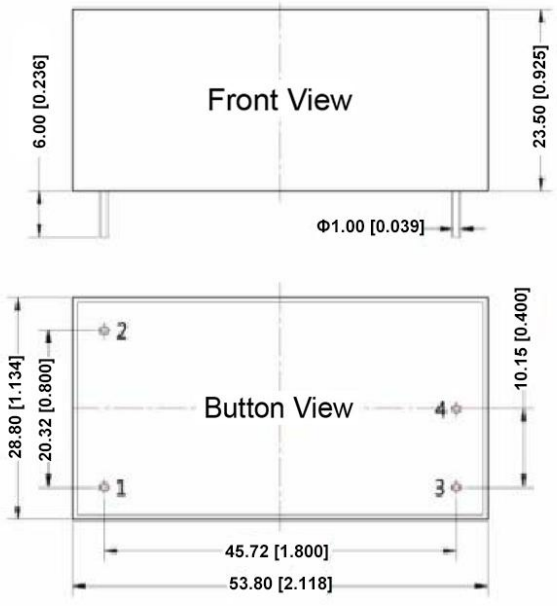
Case Material	Black flame-retardant heat-resistant plastic（UL94V-0）

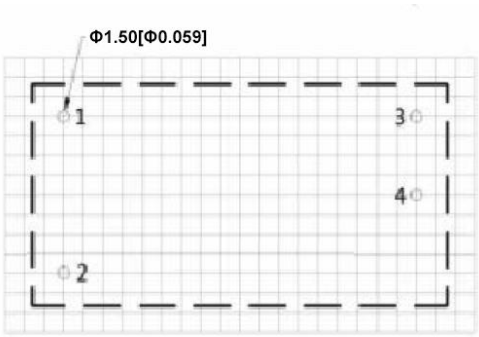
Packing Dimension	Horizontal package	53.8X28.8X23.5 mm
Product Weight		50g（TYP）
Cooling Method		Natural air cooling

EMC Characteristics

Total Item		Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B
		RE	CISPR22/EN55032	CLASS B
	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, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B

Packing Dimension





Note：Grid: 2.54*2.54mm

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

Note:
Unit:mm[inch]
Pin section tolerances: ±0.10mm[±0.004 inch]
General tolerances: ±0.25mm[±0.010inch]

Packing Code	L x W x H

P2A	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.

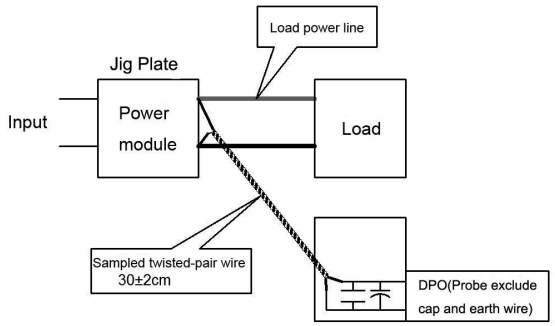
Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

Test Method:

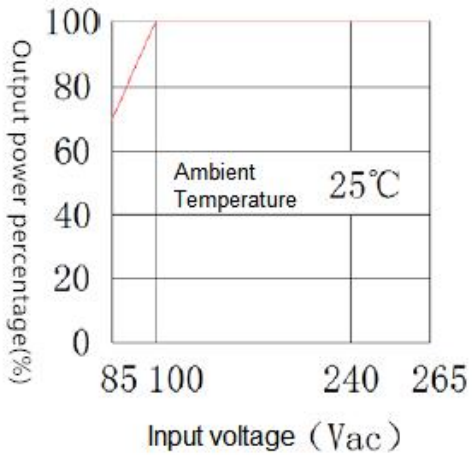
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

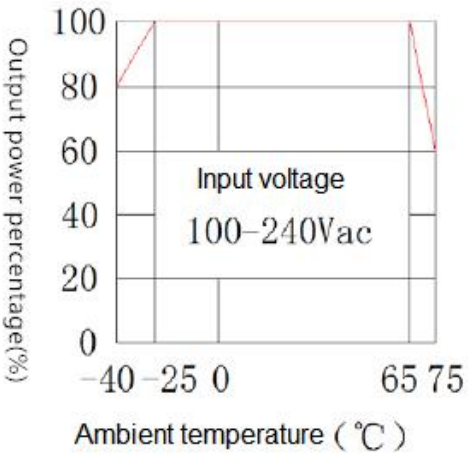
(2)Output Ripple&Noise Test Method:

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

图1

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 back-end circuit when the module fails. Please choose the right model per the upper table.

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

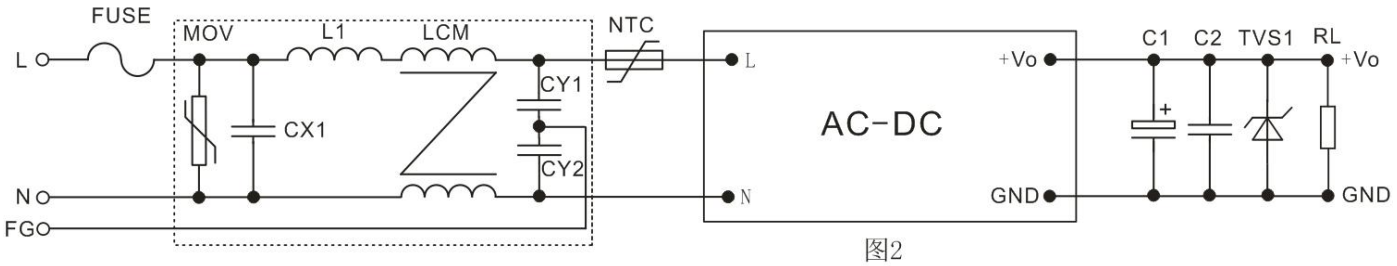


图2

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℃, 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.

