Typical Features

- Wide Input Voltage Range : 85-265VAC/120-370VDC
- No load power consumption ≤0.5W
- Transfer Efficiency:78%
- Switching Frequency: 65KHz
- Protections: Short-circuit, Over-current, Over-voltage
- Isolation voltage: 4000Vac
- 4000m altitude application
- Meet CISPR32/EN55032 CLASS B
- Pass CE、RoHS certificate standard
- Plastic case , meet UL94 V-0
- PCB Mounting

Application Field

FA20-220E05XXH2N4 *Series ----- is a small size, high efficiency module power supply provided by Aipu for customers. This series of power supplies have the advantages of global input voltage range, AC and DC dual purpose, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, high safety isolation, and good EMC performance. EMC and safety specifications meet international EN55032 and IEC/EN61000 standards. This series of products have a wide range of applications in many fields such as electric power, industry, instrumentation and smart home. When the product is used in a harsh environment with electromagnetic compatibility, please refer to the application circuit given by our company.*

Typical Product List

- 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	Voltage 1	Voltage 2	Voltage 1	Voltage 2	
	（W）	Vo1（V）	Io1（mA）	Vo2（V）	Io2（mA）	Vo1/uF	Vo2/uF	mVp-p		%
FA20-220E0512H2N4	20	5	2500	12	600	8000	680	100	120	78
FA20-220E0524H2N4	20	5	2500	24	300	8000	470	100	200	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 output efficiency is based on that product is full loaded and burned-in after half an hour.

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

Note 4: "*" is model under developing.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	85	220	265	VAC
	DC Input	120	310	370	VDC

Input Frequency Range	-	47	50	63	Hz
Input Current	115Vac	-	-	0.6	A
	220Vac	-	-	0.3	
Surge Current	115Vac	-	25	-	
	220Vac	-	45	-	
No Load Power Consumption	Input 115VAC	-		0.5	W
	Input 230VAC	-			
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
External Fuse Recommend Value	-				
Hot Plug	-	Not support			
Remote Control Terminal	-	No remote control terminal			

Output Specifications

Item	Operating Condition		Min.	Typ.	Max.	Unit
Voltage Accuracy	Full input voltage range, any load	Vo1	-	-	±1.5	%
		Vo2	-	-	±10.0	%
Linear adjustment rate	Nominal Load	Vo1	-	-	±1.0	%
		Vo2	-	-	±2.0	%
Load regulation rate	Nominal input voltage, 20 %~100% load	Vo1	-	-	±2.0	%
		Vo2	-	-	±5.0	%
Minimum Load	Dual isolated output		10	-	-	%
Turn-on Delay Time	Input 115Vac（Full load ）		-	2000	-	mS
	Input 220Vac（Full load ）		-	1000	-	
Power-down hold time	Input 115VAC（Full load ）		-	10	-	mS
	Input 220VAC（Full load）		-	60	-	
Dynamic Response	25%~50%~25% 50%~75%~50%		Overshoot amplitude（%）：≤±5.0			%
			Recovery Time（mS）：≤5.0			mS
Output overshoot	Input full voltage range		Vo1	≤10%Vo		%
Short circuit protection			Continuous short-circuit, self-recovery			Hiccup
Drift coefficient	-		-	±0.05%	-	%/℃
Overcurrent protection	Input 220VAC（VO1）(VO2) rated load		≥130% Io Self-recovery			Hiccup
Overvoltage protection	output 5VDC		≤7.5			VDC

Ripple noise	Vo1	-		100	mV
	Vo2(12V)			120	
	Vo2(24V)			200	
	Note 1: The test method of ripple and noise adopts the twisted-pair test method. For the specific test method and configuration, please refer to the following (ripple & noise test description).				

General Specifications

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+105	℃
	Need to use temperature derating on the basis of temperature derating curve, see the following (product characteristic curve) for the derating curve				
Storage Temperature	-	-40	-	+110	
Welding 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
	Input-PE, Test 1min, leakage current≤5mA	2500			
	Vo1-Vo2, Test 1min, leakage current≤5mA	500			VDC
	Input-Output@ DC500V	100	-	-	MΩ
Safety Standard	-	IEC62368/EN62368/UL62368			
Vibration	-	10-55Hz,10G,30Min,along X,Y,Z			
Safety Class	-	CLASS Ⅰ			
Class of Case Material	-	UL94V-0 Class			
MTBF	-	MIL-HDBK-217F@25℃＞300,000H			

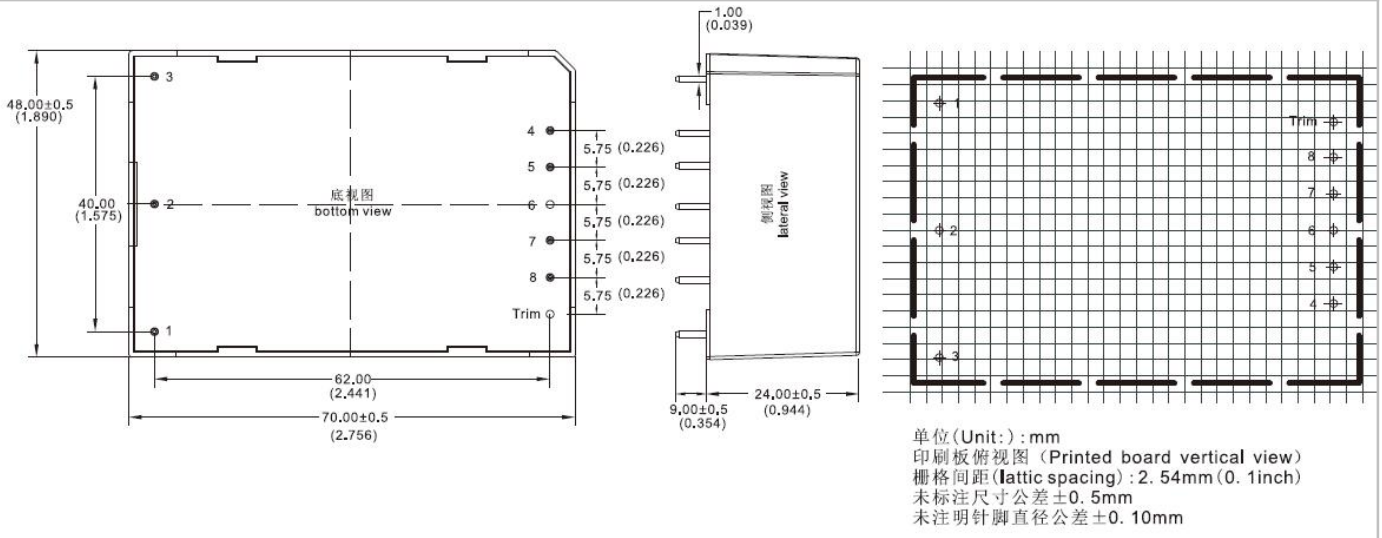
Physical characteristics

Case Material		Black flame-retardant heat-resistant plastic（UL94V-0）
Packing Dimension	Horizontal package	70.0X48.0X24.0 mm
Product Weight		142g（TYP）
Cooling Method		Natural air cooling

EMC Characteristics

Total Item		Sub Item	Test 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
		Surge	IEC/EN61000-4-5	Line to line ±1KV/ line to ground ±2KV Perf.Criteria B
				Line to line ±2KV/ line to ground ±4KV Perf.Criteria B （Recommended Circuit 2）
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B
				±4KV Perf.Criteria B
		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	
H2	70.0X 48.0X24.0 mm	2.756X1.890X0.945inch

Pin Definition

Pin-out	1	2	3	4	5	6	7	8	9
Single（S）	FG	AC（N）	AC（L）	+Vo2	-Vo2	NC	+Vo1	-Vo1	NC

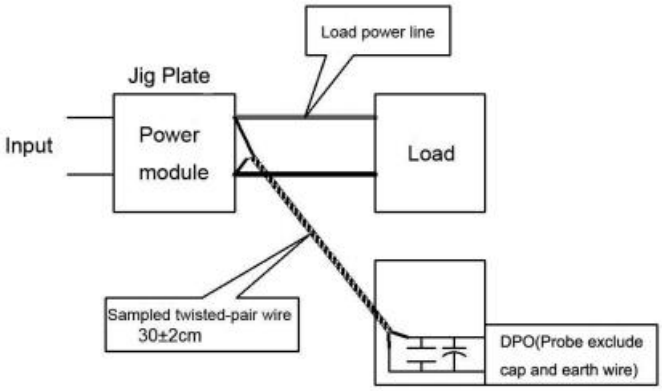
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

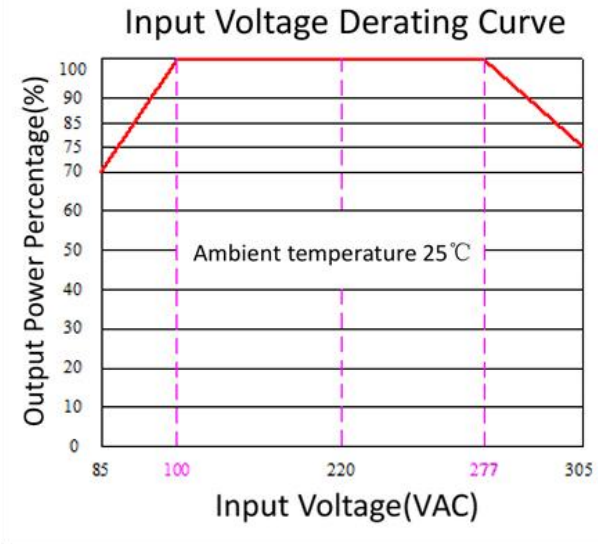
Test Method:

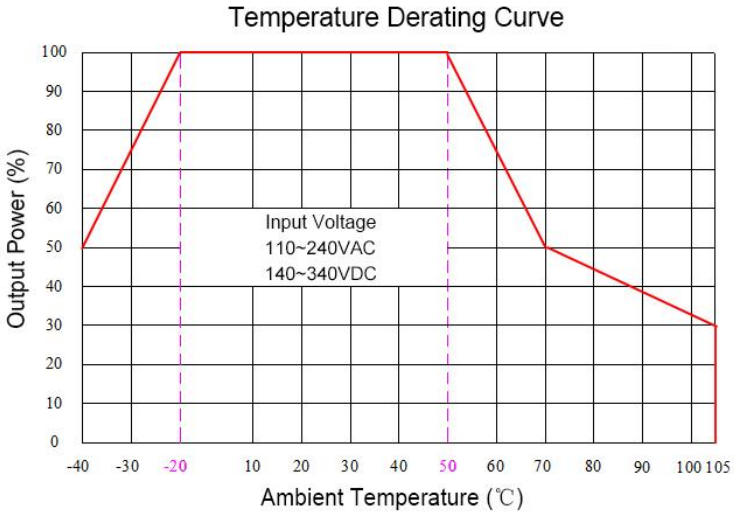
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

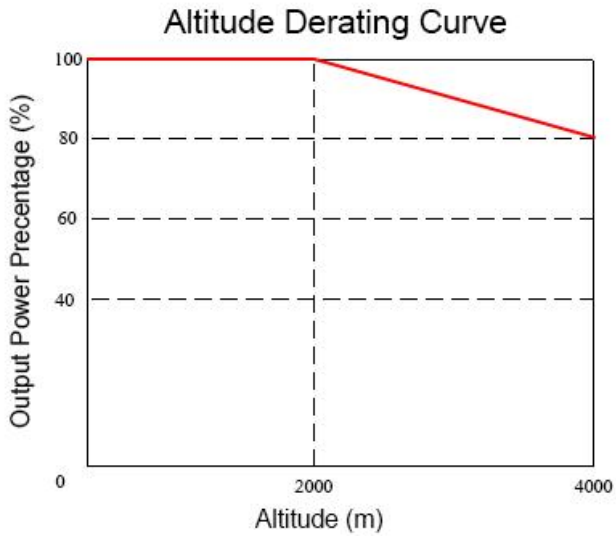
(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve







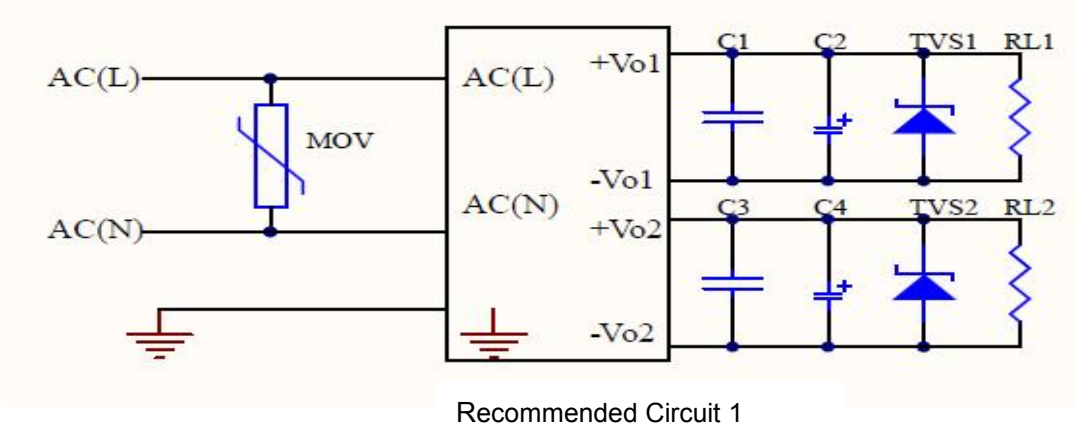
Note

1: Input Voltage should be derated base on Input Voltage Derating Curve when it is 85~100VAC/240~265VAC/120~140VDC/ 340~370VDC.

2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact.

Design Reference Application

1. Typical Application Circuit



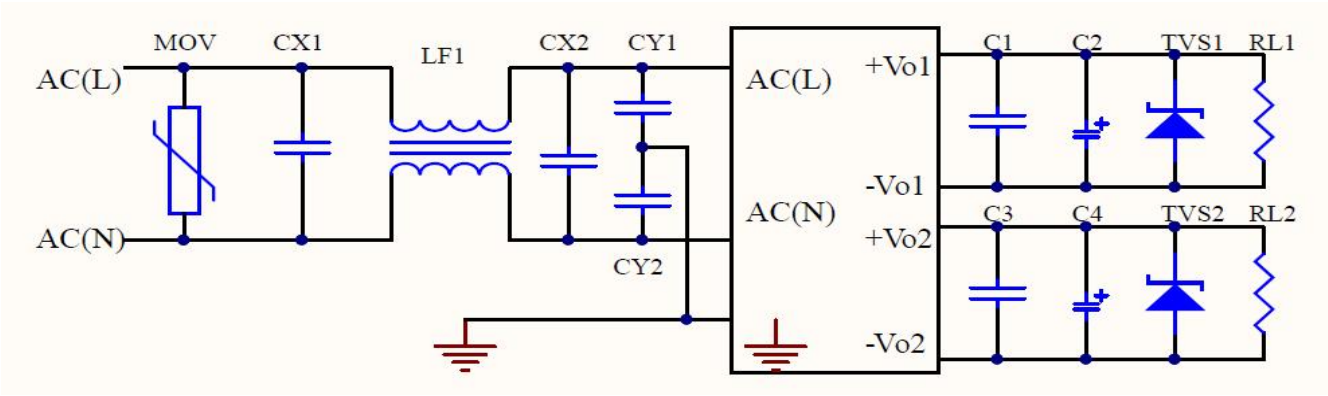
Recommended Circuit 1

Part no.	C1,C3	C2	C4	TVS1	TVS2
FA20-220S0512H2N4	0.1uF	470uF	470uF	SMBJ7.0A	SMBJ20.0A
FA20-220S0524H2N4			220uF		SMBJ30.0A

Note:

Output filter capacitors C2 and C4 are electrolytic capacitors. It is recommended to use high-frequency low-resistance electrolytic capacitors. For the capacity and current flowing through, please refer to the technical specifications provided by each manufacturer. The withstand voltage of C2 and C4 capacitors should be reduced to at least 80%. C1 and C3 are ceramic capacitors to remove high-frequency noise. It is recommended to use 0.1uF/50V. TVS1 and TVS2 tubes are recommended to protect the subsequent circuit when the module is abnormal.

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



Recommended Circuit 2

Device Tag	Device name	Device part number	Recommended device value
MOV	Varistor	14D561K	14D561K
CX1	X capacitor	0.22uF/275Vac	0.22uF/275Vac
CX2	X capacitor	0.22uF/275Vac	0.22uF/275Vac
LF1	Common mode inductor	绿环30mH/2.5A T12X7X6mm	30mH/2.5A
CY1,CY2	Y capacitor	102M/400V	102M/400V

Note:
1. The product should be used within the specification range, otherwise it will cause permanent damage to the product;
2. 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;
3. 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;
4. Unless otherwise specified, the above data are measured at Ta=25℃, humidity<75%, input nominal voltage and output rated load (pure resistance load);
5. All the above index test methods are based on our company's standards;
6. 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.
7. Our company can provide product customization;
8. 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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