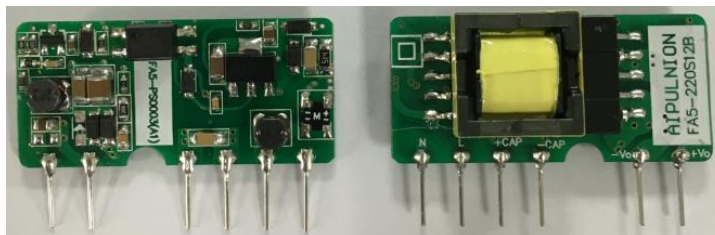


Typical Features

- ◆ Wide input voltage range: 85-265VAC/90-400VDC
- ◆ No load power consumption $\leq 0.1W$
- ◆ Transfer efficiency (typ. 82%)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over-current, over-voltage
- ◆ Isolation voltage: 4000Vac
- ◆ Conform to IEC60950/UL60950/EN60950 test standard
- ◆ CE Approved
- ◆ Ultra small bare board, industrial level design
- ◆ PCB mounting



Application Field

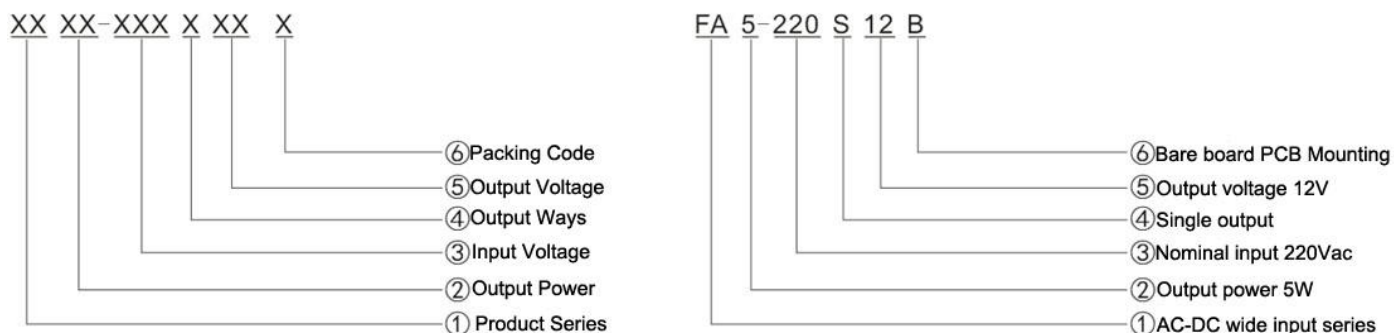
FA5-220SXXB Series----- a compact size, high efficient, meet CE standard power module offered by Aipu.

It features universal input voltage range, DC and AC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation. with good EMC performance, meet international EN55032, IEC/EN61000 standard.

This series have very important application for power, industrial, instrument, smart home field.

The application circuit in the datasheet is strongly recommended for harsh EMC environment.

Product Named Method



Typical Product List

Certificate	Part No	Output Specifications					Max. Capacitive Load	Ripple & Noise 20MHz (Max)	Efficiency@ Full Load , 220Vac (Typical)
		Power	Voltage1	Current1	Voltage2	Current2			
		(W)	Vo1(V)	Io1(mA)	Vo2(V)	Io2(mA)			
CE	FA5-220S05B	5	5	1000	-	-	1500	50	75
	FA5-220S09B	5	9	556	-	-	680	80	78
	FA5-220S12B	5	12	416	-	-	470	80	82
	FA6-220S15B	5	15	333	-	-	330	100	83
	*FA5-220S24B	5	24	208	-	-	100	120	84

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 being developing.

Note 3: The typical value of output efficiency is based on full load and burn-in after half an hour.

Note 4: The fluctuation range of full load efficiency at table(% ,TYP) is $\pm 2\%$, full load 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	90	310	400	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	115VAC	/	/	0.2	A
	220VAC	/	/	0.11	
Surge Current	115VAC	/	/	5	
	220VAC	/	/	10	
Leakage Current	-	0.25mA TYP/230VAC/50Hz			
External Fuse Recommended Value	-	1A-3A/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	-	-	-	%
No Load Power Consumption	Input 115VAC		-	-	0.1	W
	Input 220VAC		-	-		
Minimum Load	Single Output		0	-	-	%
	Dual output Common Ground		-	-	-	%
	Dual output Isolated		-	-	-	
Start-up Delay Time	Nominal input voltage (full load)		-	100	-	mS



Power-off Holding Time	Input 115VAC (full load)		20		mS
	Input 220VAC (full load)	--	80	-	
Dynamic Response	25%~50%~25%	Overshoot range(%):≤±5.0			%
	50%~75%~50%	Recovery time(mS):≤5.0			mS
Output Overshoot	Full input voltage range	≤10%Vo			%
Short Circuit Protection		Continuous, Self-recovery			Hiccup
Temperature Coefficient	-	-	±0.03%	-	%/℃
Over Current Protection	Full input voltage range	≥150% Io self-recovery			Hiccup
Over Voltage Protection	Output 5.0VDC	≤7.5			VDC
	Output 12VDC	≤18			
	Output 15VDC	≤20			
	Output 24VDC	≤30			
Ripple & Noise	-	-	50	120	mV
	Note: Ripple & Noise is tested by twisted pair method, for details please see(Ripple& Noise Test) at back.				

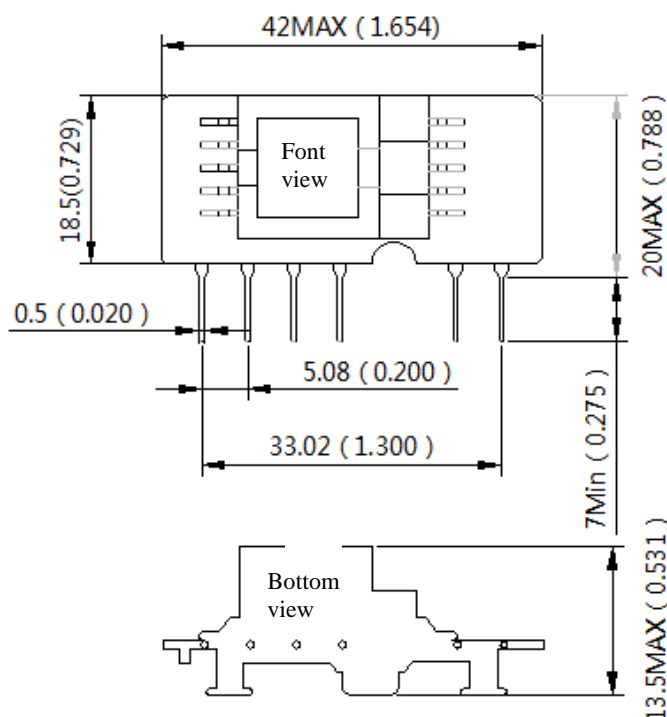
General Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+85	℃
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 Resistor	Input-Output@DC500V	100	-		MΩ
Safety Standard	-	EN60950, IEC60950			
Vibration	-	10-55Hz, 10G, 30Min, along X, Y, Z			
Safety Class	-	CLASS II			
Class of Case Material	-	UL94 V-0			
MTBF	-	MIL-HDBK-217F@25℃>300,000H			

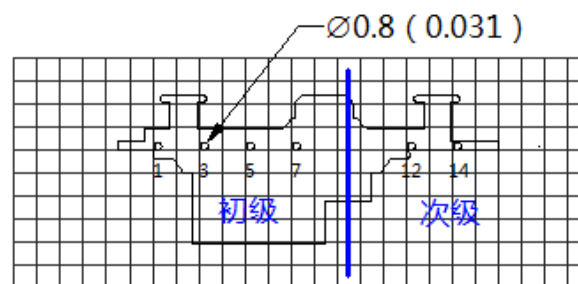
EMC Characteristics

Total Item	Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032
		RE	CISPR22/EN55032
	EMS	RS	10V/m Perf.Criteria B (recommend circuit see photo1)
		CS	3Vr.m.s Perf.Criteria B(recommend circuit see photo1)
		ESD	Contact $\pm 6KV$ / Air $\pm 8KV$ Perf.Criteria B
		Surge	$\pm 1KV$ Perf.Criteria B
		EFT	$\pm 2KV$ Perf.Criteria B
		Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%~70% Perf.Criteria B

Dimension



Note:
Unit: mm[inch]
Pin section tolerance: $\pm 0.10[\pm 0.004]$
General tolerance: $\pm 0.50[\pm 0.0020]$



primary secondary

Grid:2.54mmx2.54mm

Pin-Out	
Pin	Function
1	AC(N)
3	AC(L)
5	+V(cap)
7	-V(cap)
12	-Vo
14	+Vo

Packing Code

L x W x H

B

42 x 20 x 13.65 mm

1.654 x 0.788 x 0.537inch

Pin Definition

Pin	1	3	5	7	12	14
Single(S)	AC(L)	AC(N)	+Cap	-Cap	-Vo	+Vo

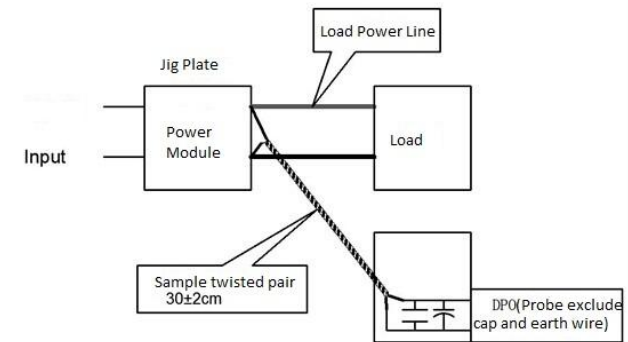
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

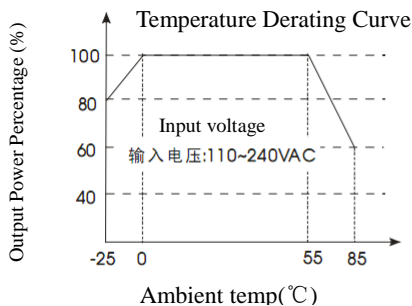
Test Method:

(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.

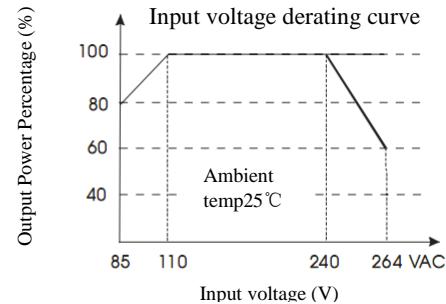
(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve



Note: input voltage should be derated based on temperature derating curve when it is 85~110VAC and 240~264VAC.



Note: for DC input, relationship between DC and AC: $V_{DC} = 1.414 * V_{AC} - 20$

Typical Application Circuit and EMC Recommended Circuit

1. Typical Application Circuit

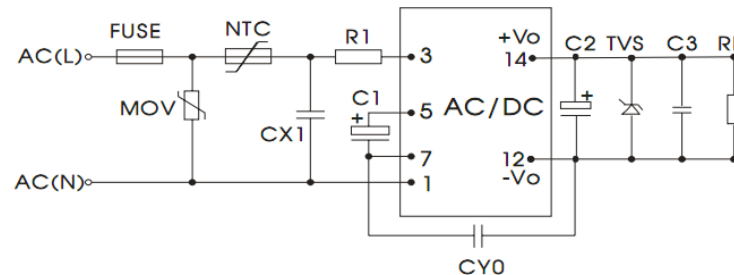


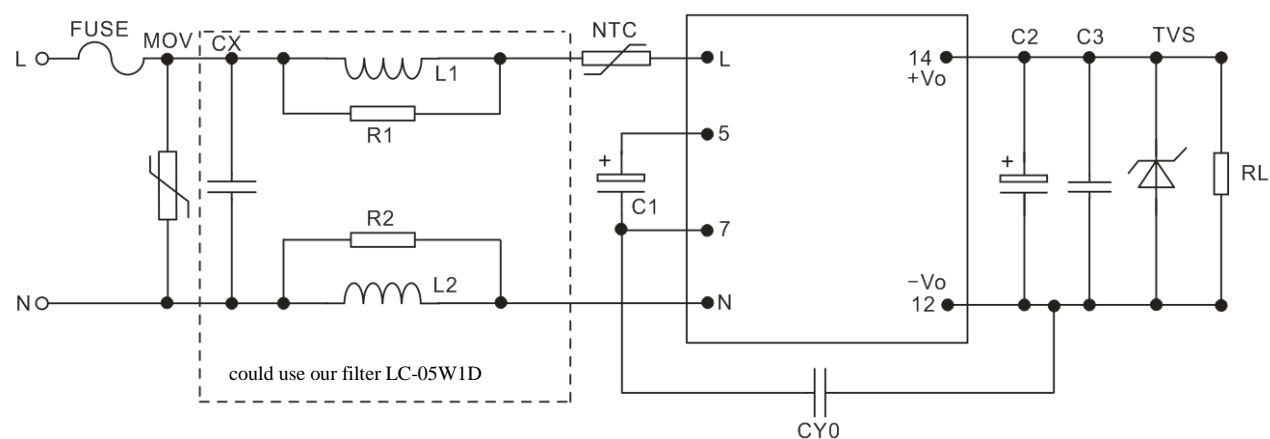
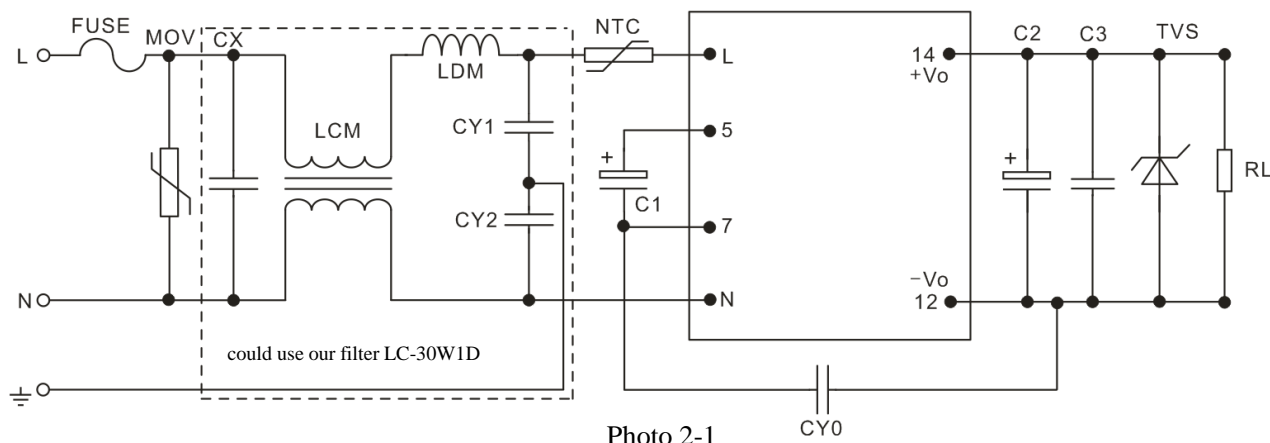
Photo 1: typical application circuit

Model	C1 (required)	C2 (required)	C3	R1	CX1	CY0	NTC	MOV	FUSE (required)	TVS
FA5-220S05B	10uF/400V	220uF/16V	100nF /50V	10Ω/2W	0.1uF/ 275VAC	1nF/ 400VAC	13D-5	14D-561K	1A/250V	SMBJ7.0A
FA5-220S09B										SMBJ12A
FA5-220S12B										SMBJ20A
FA5-220S15B		150uF/35V								SMBJ20A
FA5-220S24B										SMBJ30A

Note:

1. C1 : AC input, C1 is input filter electrolytic capacitor(which is required), C1 recommend value 10uF/400V.
DC input, C1 is a big filtering capacitor in EMC filter(which is required), recommend value 10uF/400V.
2. C2 is output filter electrolytic capacitor(which is required) , recommended to use high frequency low resistance electrolytic capacitor, capacitance and rated voltage please refer to above spec.
3. C3 is ceramic capacitor, to filter high frequency noise.

2.EMC solution-recommended circuit(under high EMC request)



FUSE	Recommended 1A, 250Vac (required)	NTC	13D-5	R1,R2	Resistance 2.2K, above 1/8W
MOV	14D511K	CY1,CY2	1nF/400VAC		
CX	0.1uF/275Vac	LDM	330uH		
LCM	30mH	L1,L2	Color ring 1mH,1W		



Note:

1. The product should be used within the specification range, or it will cause permanent damage to it;
2. The input terminal should connect to fuse;
3. If the product is operated under the minimum load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
4. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
5. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% with nominal input voltage and rated output 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 product customization service,
9. Specifications are subject to change without prior notice.

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