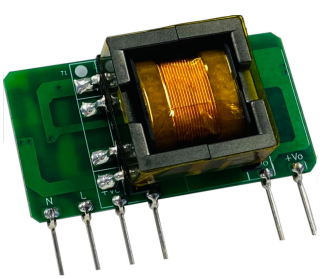
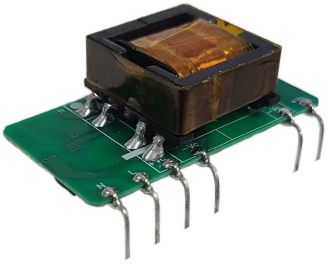
AC/DC Converter
FA15-220SXXB9N3(-1) Series

Typical Features

- ◆ Wide input voltage range: 85-305VAC/120-430VDC
- ◆ No load power consumption ≤ 0.25W
- ◆ Transfer Efficiency 85%(TYP.)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over current
- ◆ Isolation voltage: 4000Vac
- ◆ Passed CE certification
- ◆ Meet IEC62368/UL62368/EN62368 test standard
- ◆ Ultra-small package for bare board, industrial design
- ◆ PCB mounting





Application Field

FA15-220SXXB9N3(-1) Series**-----** *a compact size, high efficient power module 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, good EMC performance. EMC and Safety standard meet international EN55032 ,IEC/EN61000. These series have important application for power, industry, instrument and smart home field. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

Typical Product List

Certificate	Part No.	Output Specifications			Max. Capacitive Load	Ripple& Noise 20MHz (Max)	Efficiency@ Full Load, 220Vac (Typical)
		Power	Voltage	Current			
		(W)	Vo(V)	Io(m A)	u F	mVp-p	%
CE	FA15-220S3V3B9N3(-1)	10	3.3	3000	2000	120	76
CE	FA15-220S05B9N3(-1)	15	5	3000	2000	120	77
CE	FA15-220S12B9N3(-1)	15	12	1250	1000	120	83
CE	FA15-220S12V7B9N3(-1)	15	12.7	1181	1000	120	82
CE	FA15-220S24B9N3(-1)	15	24	625	800	150	85

Note 1: Due to limited space, the above is only a partial list of products. If you need products outside the list, please contact our sales department.

Note 2: The typical value of output efficiency is based on the product aging for half an hour at full load.

Note 3: "*" represents a model under development.

Note 4: The full load efficiency (%, TYP) in the table fluctuates by ±2%. The full load efficiency is the total output power divided by the input power of the module.

Note 5: The test method for ripple and noise adopts the twisted pair test method. The specific test method and matching can be seen later (Ripple & Noise Test Instructions).

Input Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Input Voltage Range	AC input	85	220	305	VAC

	DC input	120	310	430	VDC
Input Frequency range	-	47	50	63	Hz
Input Current	115VAC	-	-	0.40	A
	220VAC	-	-	0.30	
Surge Current	115VAC	-	-	10	
	220VAC	-	-	20	
Leakage Current	-	0.25mA TYP/230VAC/50Hz			
Recommended External Input Fuse	-	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	Vo	-	±2.0	±3.0	%
Line Regulation		Nominal load	Vo	-	-	±1.0	%
Load Regulation		Nominal input voltage, 20%~100% load	Vo	-	-	±1.0	%
No Load Consumption		Input 115VAC		-	-	0.25	W
		Input 220VAC		-	-		
Minimum Load		Single Output		0	-	-	%
Start up Delay Time		Nominal input voltage (full load)		-	1000	-	mS
Power-off Holding Time		Input 115VAC (full load)			50		mS
		Input 220VAC (full load)		-	80	-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
	Recovery time			-	5.0	-	mS
Output Overshoot		Full input voltage range		≤10%Vo			%
Short circuit Protection				Continuous, self-recovery			Hiccup
Temperature Drift		-		-	±0.03	-	%/℃
Over Current Protection		Input 220VAC		≥130% Io, self-recovery			Hiccup

General Specifications

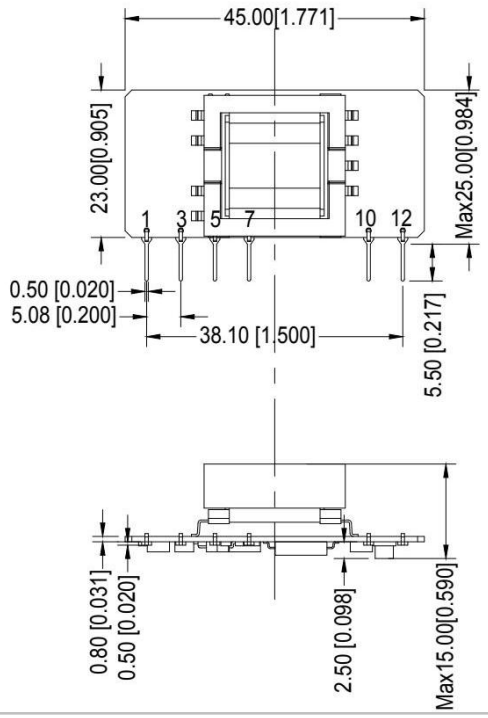
Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+85	℃
Storage Temperature	-	-40	-	+105	
Soldering Temperature	Wave soldering	260±4℃, time 5-10S			

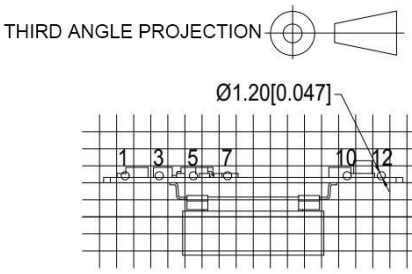
		Manual soldering	360±8℃, time 4-7S			
Relative Humidity		-	10	-	90	%RH
Isolation Voltage	Input-Output	Test 1min, leakage current≤5mA	4000	-	-	VAC
Insulation Resistance	Input-Output	@ DC500V	100	-	-	MΩ
Safety Standard		-	EN62368, IEC62368			
Vibration		-	10-55Hz,10G, 30Min,alongX,Y,Z			
Safety Standard		-	CLASS Ⅱ			
MTBF		-	MIL-HDBK-217F@25℃＞300,000H			

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 A (Recommended Circuit 1)
		CS	IEC/EN61000-4-6	10Vr.m.s Perf.Criteria A (Recommended Circuit 1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B (Recommended Circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B ±4KV Perf.Criteria B (Recommended Circuit 2)
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

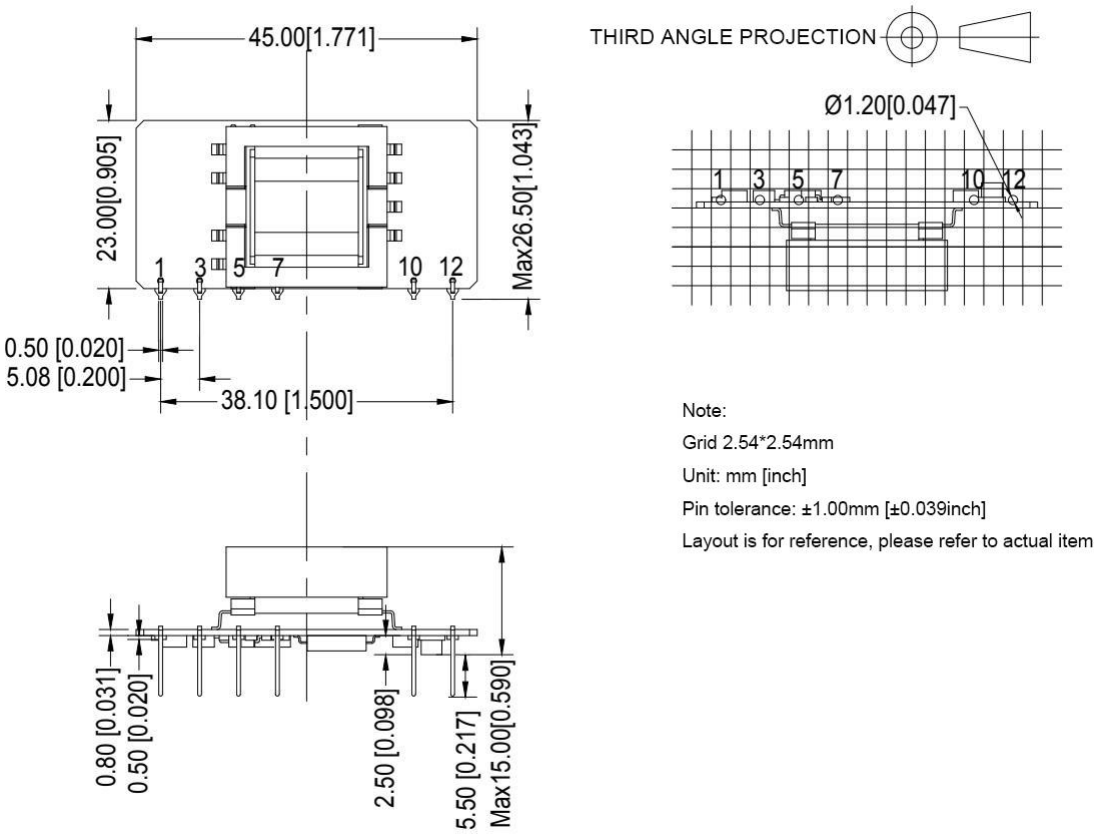
Dimension





Note:
Grid 2.54*2.54mm
Unit: mm[inch]
Pin tolerance:±1.00mm[±0.039inch]
Layout is for referenvce, please refer to actual item

Dimension(-1)



Note:
Grid 2.54*2.54mm
Unit: mm [inch]
Pin tolerance: ±1.00mm [±0.039inch]
Layout is for reference, please refer to actual item

Packing Code	L x W x H	
-	45.0X23.0X15.0mm	1.771X0.905X0.590inch

Pin Specification

Pin	1	3	5	7	10	12
Single(S)	AC(N)	AC(L)	+Vc	-Vc	-Vo	+Vo

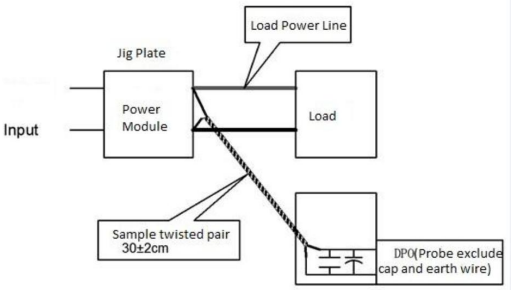
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

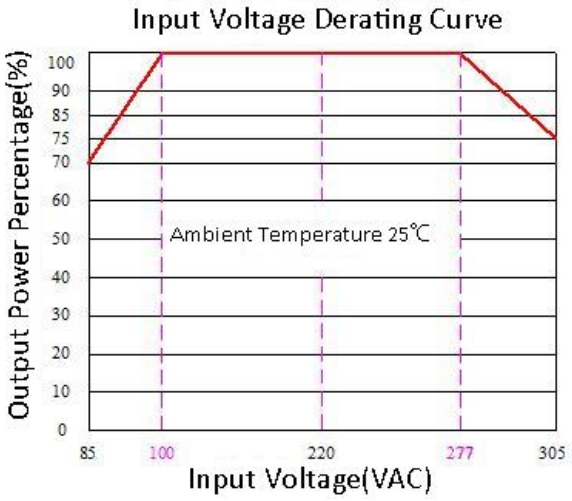
Test Method:

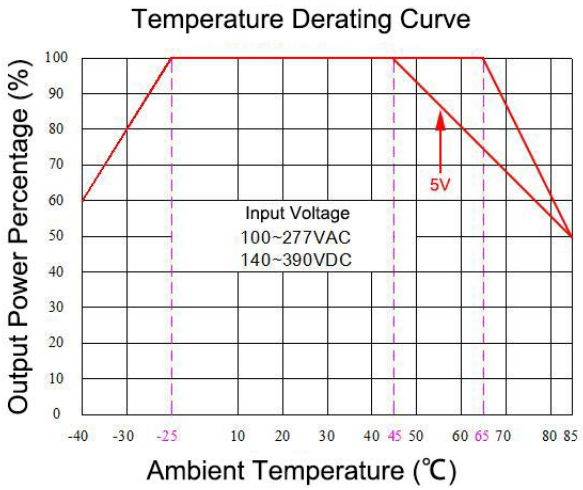
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(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



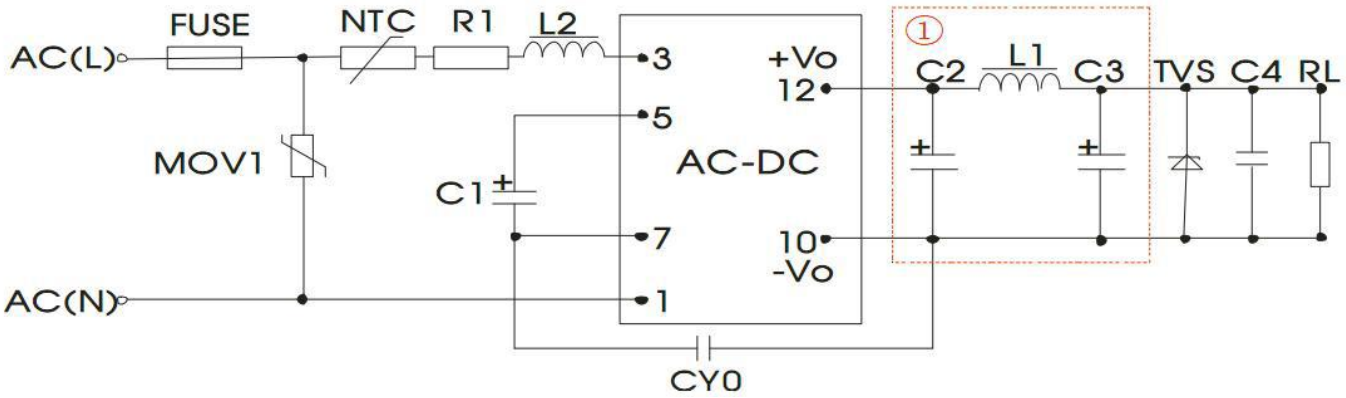


Note 1: Input Voltage should be derated based on Input voltage derating curve when it is 85~100VAC/277~305VAC/120~140VDC/ 390~430VDC

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

Typical Application Circuit and EMC Recommended Circuit

1.Typical Application Circuit



Recommended Circuit 1

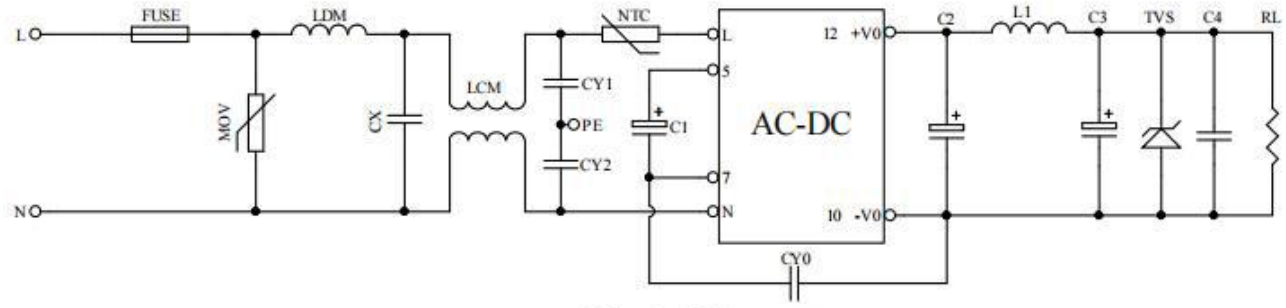
Note:①as PI filter circuit

Products Number	C1 (Necessary)	C2 (Necessary)	L1 (Necessary)	C3 (Necessary)	C4	L2	NTC	CY0	FUSE (Necessary)	TVS Tube
FA15-220S3V3B9N3(-1)	33uF /450V	1000uF/10V	2.0uH	680uF/10V	0.1uF/ 50V	4.7mH	5D-9	102M/ 400V	3.15A/ 250V	SMBJ7.0A
FA15-220S05B9N3(-1)										
FA15-220S12B9N3(-1)		470uF/16V		220uF/16V						SMBJ20A
FA15-2220S12V7B9N3(-1)		470uF/16V		220uF/16V						SMBJ20A
FA15-220S24B9N3(-1)		470uF/35V		220uF/35V						SMBJ30A

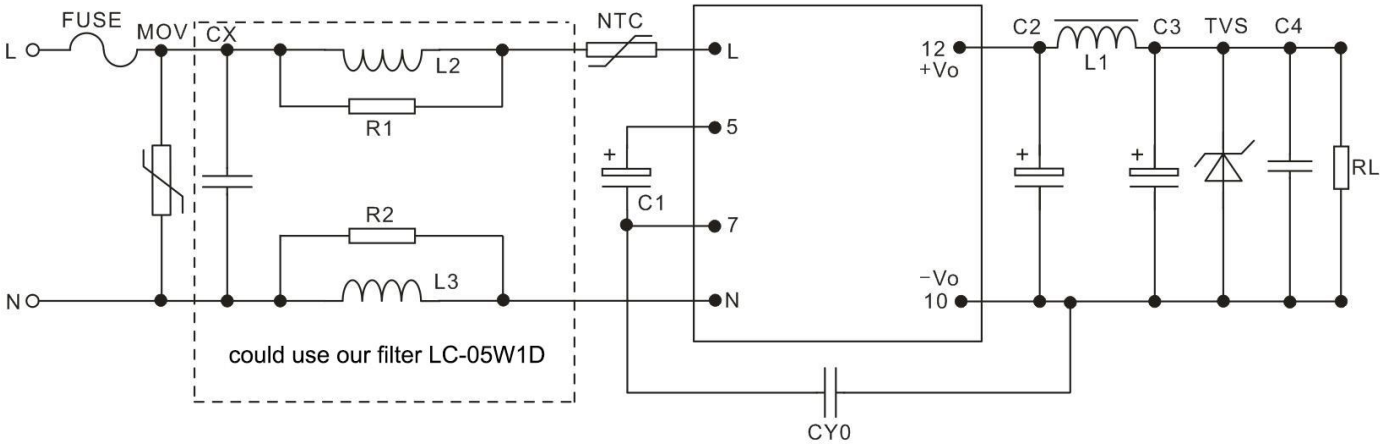
Note:

1) C1: AC input, C1 is input filter electrolytic capacitor (necessary), recommended value is 33uF/450V;
   DC input, C1 is big filter capacitor in the EMC filter (necessary), recommended value is 33uF/450V;
2) R1 is limited resistor, recommended value is 12Ω, 5W;
3) MOV1 is piezoresistor, recommended model is 10D561K;

2. EMC recommended circuit (Used Under high EMC requirement)



Recommended Circuit 2-1



Recommended Circuit 2-2

FUSE	Recommend 3.15A, 250V (necessary)	NTC	5D-9	R1, R2	Resistance 2.2K, above 1/8W
MOV	10D561K	CY0, CY1, CY2	1nF/400VAC		
CX	Recommend 0.22uF/275Vac	LDM	820uH		
LCM	40mH min	L2, L3	Color ring inductor 1mH, 1W		

Note 2:

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 worked under the minimum requested load, 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 **Ta=25℃**, **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, please follow up with our website for newest manual.

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