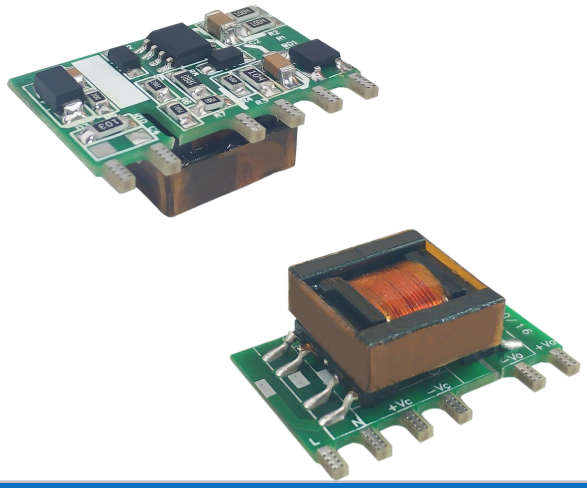
Typical Features

- ◆ Wide input voltage range: 85-305VAC/120-430VDC
- ◆ No load power consumption ≤ 0.1W
- ◆ Transfer Efficiency up to 82%(TYP.)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over current
- ◆ Isolation voltage: 3000Vac
- ◆ Meet IEC60950/UL60950/EN60950 test standard
- ◆ Ultra-small bare board, industrial design
- ◆ PCB mounting



Application Field

DA5-220SXXG9N3 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	Voltage1	Current1	Voltage 2	Current 2	u F	mVp-p	%
		(W)	Vo1(V)	Io1(m A)	Vo2(V)	Io2(m A)			
-	DA5-220S3V3G9N3	3	3.3	1000	-	-	2000	120	65
-	DA5-220S05G9N3	5	5	1000	-	-	2000	130	70
-	DA5-220S09G9N3	5	9	556	-	-	1000	120	74
-	DA5-220S12G9N3	5	12	416	-	-	68	120	79
-	*DA5-220S15G9N3	5	15	333	-	-	68	120	79
-	*DA5-220S24G9N3	5	24	208	-	-	47	120	82

Note 1: The typical value of output efficiency is based on module is full loaded and burned-in after half an hour.

Note 2: "*" are models being developing.

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

Note 4: Ripple & Noise is tested by twisted pair method, details please refer to Ripple & Noise test at back.

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	/	/	0.11	A
	220VAC	/	/	0.07	
Surge Current	115VAC	/	/	11	
	220VAC	/	/	21	
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	Input voltage 220V, any load	-	±5.0	±10.0	%
Line Regulation	Nominal load	-	±2.0	±4.0	%
Load Regulation	Nominal input voltage, 20%~100% load	-	±3.0	±6.0	%
No Load Consumption	Input 115VAC	-	-	0.1	W
	Input 220VAC	-	-		
Minimum Load	Single Output	20	-	-	%
Start up Delay Time	Nominal input voltage (full load)	-	600	-	mS
Power-off Holding Time	Input 115VAC (full load)	-	50	-	mS
	Input 220VAC (full load)	-	80	-	
Dynamic Response	25%~50%~25% 50%~75%~50%	Overshoot range(%):≤±5.0			%
		Recovery time(mS):≤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	≥110% Io self-recovery			Hiccup

General Specifications

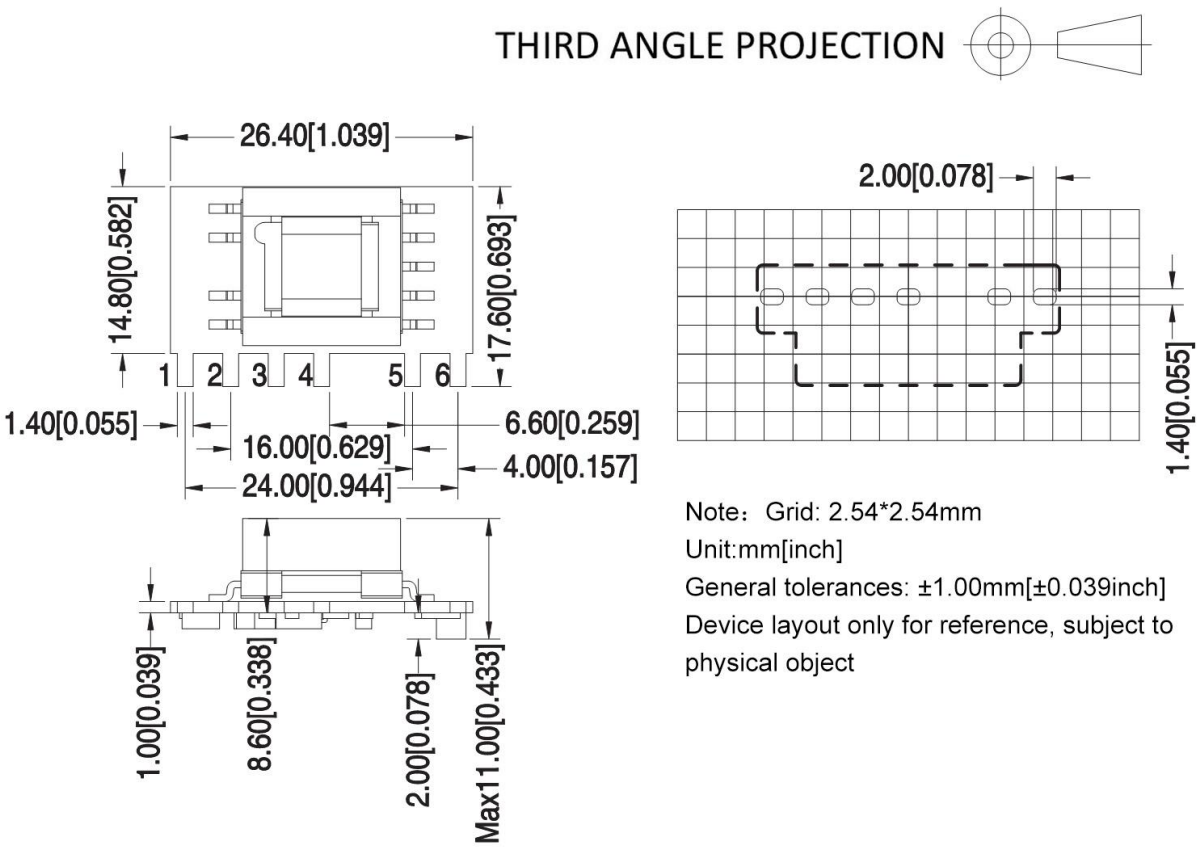
Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+75	℃
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave soldering	260±4℃, time 5-10S			
	Manual soldering	360±8℃, time 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	Input-Output,Test 1min,leakage current≤5mA	3000	-	-	VAC
Insulation Resistance	Input-Output@ DC500V	100	-	-	MΩ
Safety Standard	-	EN60950, IEC60950			
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 (See Recommended Circuit on photo 2)
		RE	CISPR22/EN55032	CLASS B (See Recommended Circuit on photo 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (See Recommended Circuit on photo 1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (See Recommended Circuit on photo 1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±1KV Perf.Criteria B
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B
		Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B

/

Dimension



Packing Code	L x W x H	
-	26.4 x 17.6 x 11 mm	1.039 × 0.693 × 0.433 inch

Pin Specification

Pin	1	2	3	4	5	6
Single（S）	AC(L)	AC(N)	+Vc	-Vc	-Vo	+Vo

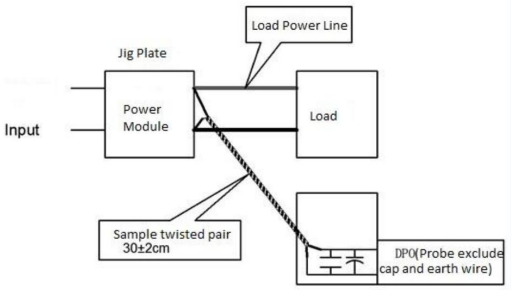
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

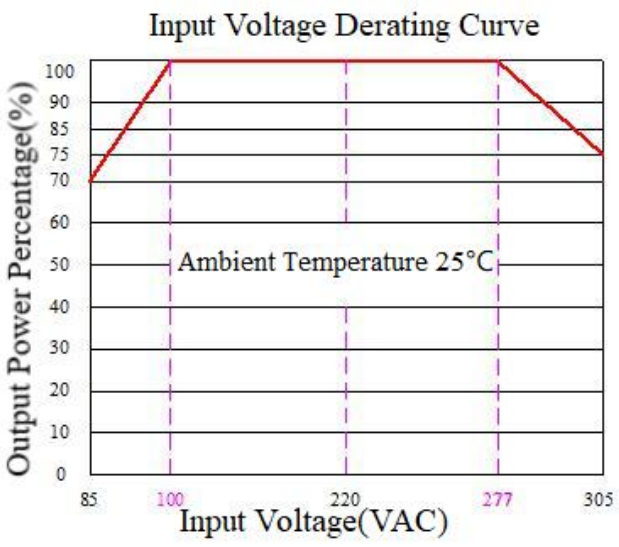
Test Method:

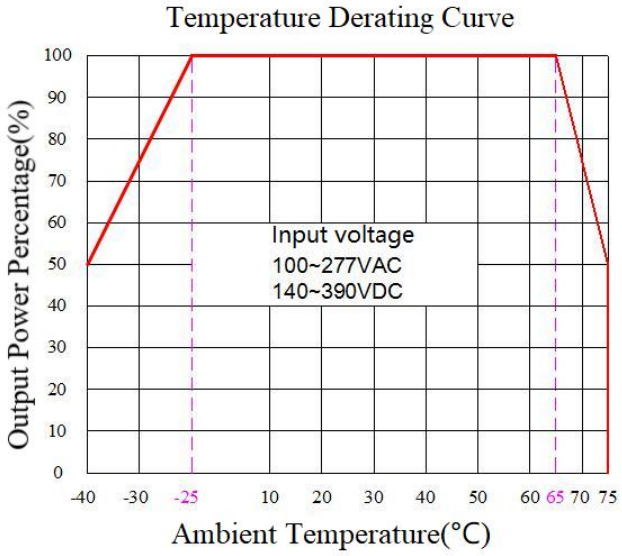
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(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

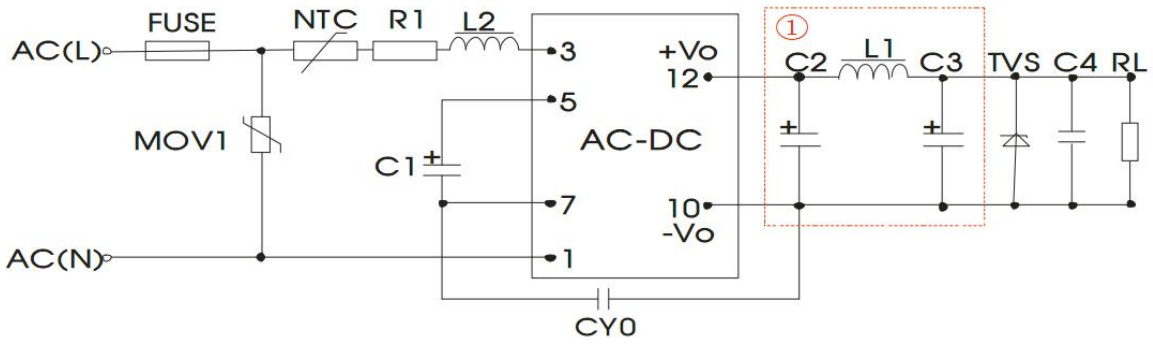


Photo 1

Note: ① is π Type filter

Products Number	C1 (Necessary)	C2 (Necessary to connect the external electrolytic capacitor)	L1 (Necessary)	C3 (Necessary to connect the external electrolytic capacitor)	C4	L2	NTC	CY0	FUSE (Necessary)	TVS Tube
DA5-220S3V3G9N3	10uF /450V	680uF/10V	2.0uH	680uF/10V	0.1uF/50V	4.7mH	5D-9	104M/ 400V	3.15A/ 250V	SMBJ7.0A
DA5-220S05G9N3		1000uF/10V		680uF/10V						SMBJ7.0A
DA5-220S09G9N3		220uF/16V		220uF/16V						SMBJ12A
DA5-220S12G9N3		220uF/16V		100uF/16V						SMBJ20A
DA5-220S15G9N3		220uF/16V		100uF/16V						SMBJ20A
DA5-220S24G9N3		100uF/35V		47uF/35V						SMBJ30A

Note:

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

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

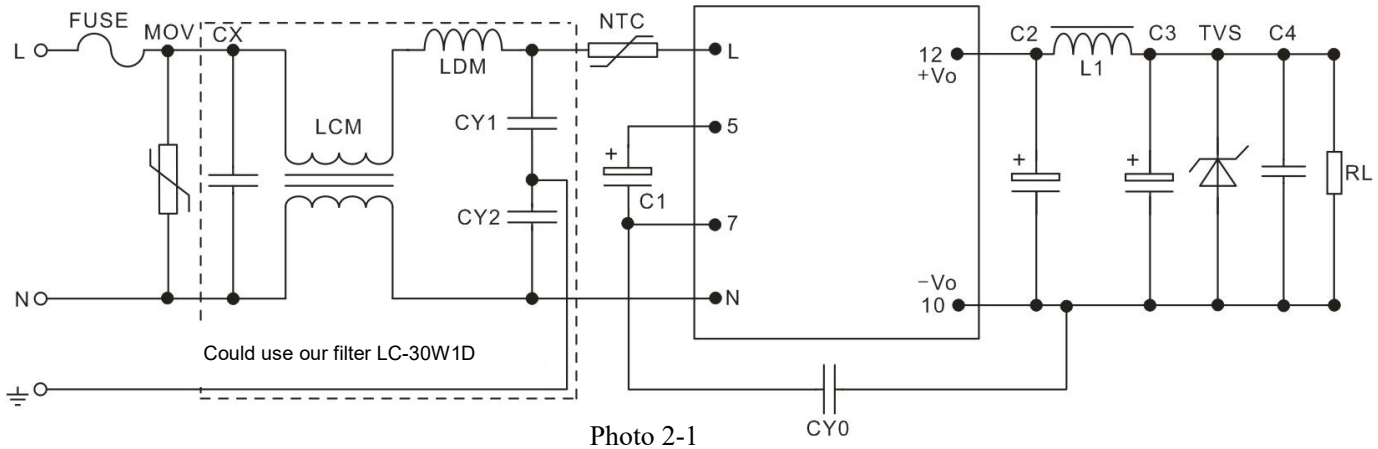


Photo 2-1

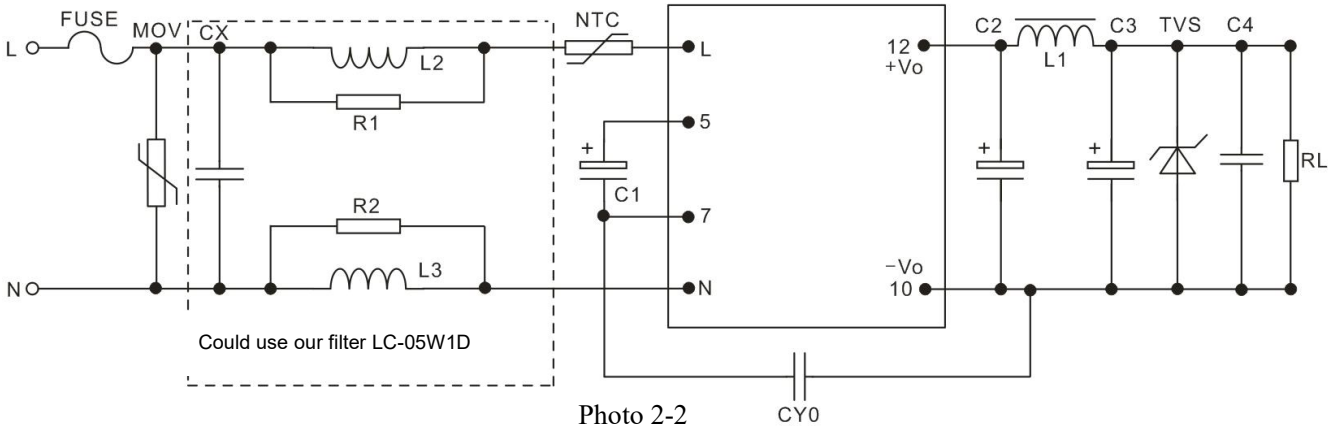


Photo 2-2

Component	Recommend Value3.15A,250V (Necessary)	NTC	5D-9	R1, R2	Resistor 2.2K, above 1/8W
MOV	10D561K	CY1，CY2	1nF/400VAC		
CX	Recommended 0.22uF/275Vac	LDM	330uH		
LCM	40mH min	L2，L3	Color ring inductor 1mH, 1W		

Note 1:

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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