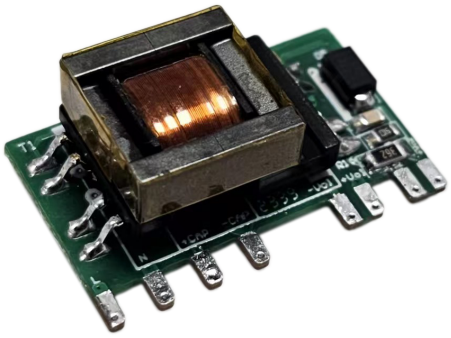
AC/DC Converter
DA5-220EXXXXGA9N4 Series

Typical Features

- ◆ Wide input voltage range: 85-305VAC/120-430VDC
- ◆ No load power consumption ≤ 0.2W
- ◆ Efficiency 78%(TYP.)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over current
- ◆ Isolation voltage: 3600Vac
- ◆ Compliance with IEC/EN62368/UL62368
- ◆ Conform to CE & RoHS Regulation
- ◆ Mini size open-frame, industrial design
- ◆ PCB mounting



Application Field

DA5-220EXXXXGA9N4 Series----- *Mini size & high efficiency power supplies presented by Aipu. The obvious advantages include universal input voltage range, both AC and DC input available, low ripple, low temperature rise, low no load power consumption, high reliability, safety isolation and good EMC performance. The application includes Electricity power, industry, instrumentation and smart home etc. The application circuit in this datasheet is recommended for higher EMC performance.*

Typical Product List

Certificate	Part No.	Output Specifications					Max. Capacitive Load @220Vac	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)			
-	DA5-220E0512GA9N4	5	5	200	12	330	1000/470	100/120	78
-	DA5-220E0524GA9N4	5	5	200	24	167	1000/220	100/150	78

Note 1: The part with * marked is developed in process.

Note 2: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 3: The full load efficiency (% Typ) should be in ±2% of the typical value in this table. The efficiency is calculated by the way that the full output power is divided by the input power.

Note 4: The ripple and noise are tested by the twisted pair method. For details understood, please refer to the following Ripple & Noise Test Instructions.

Note 5: Please contact with Aipu sales for different output voltages requirement in this series.

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	-	47	50	63	Hz
Input Current	115VAC	/	/	0.15	A
	220VAC	/	/	0.08	
Surge Current	115VAC	/	/	11	
	220VAC	/	/	21	
Leakage Current	-	0.25mA TYP/230VAC/50Hz			
Recommended Fuse	-	1A-3A/250VAC (Time-delay fuse)			
Hot Plug	-	NA			
Remote Control Terminal	-	NA			

Output Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Voltage Accuracy	Full input voltage range @10%-100% load	-	±2.0	±3.0	%(Vo1)
		-	±2.0	±5.0	%(Vo2)
Line Regulation	Rated load	-	±0.5	±1.0	%(Vo1)
		-	±0.5	±2.0	%(Vo2)
Load Regulation	Rated input voltage @ 20%~100% load	-	±0.5	±1.0	%(Vo1)
		-	±0.5	±2.0	%(Vo2)
No Load Power Consumption	Input 115VAC	-	-	0.20	W
	Input 220VAC	-	-		
Minimum Load	Dual Output	10	-	-	%
Start-up Delay Time	Rated input voltage (full load)	-	600	-	mS
Holding Up 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	≥120% Io self-recovery			Hiccup

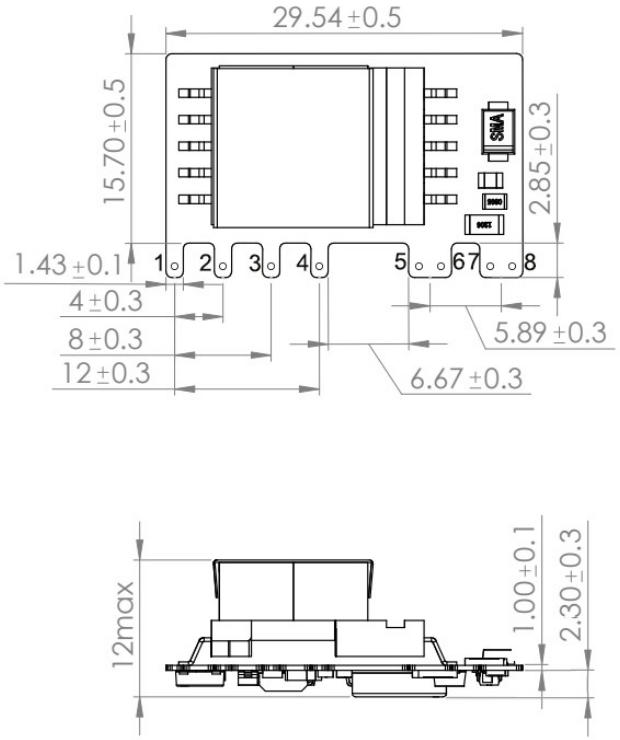
General Specifications

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			
Humidity	-	10	-	90	%RH
Isolation Voltage	Between Input & Output, 1 min.	3600	-	-	VAC
	Between Vo1 & Vo2, 1 min.	500	-	-	VDC
Insulation Resistance	Input-Output@ DC500V	100	-	-	MΩ
Safety Standard	-	EN / IEC62368			
Vibration	-	10-55Hz,10G,30 Min, along X,Y,Z			
Safety Standard	-	Class II			
MTBF	-	MIL-HDBK-217F@25℃＞300,000H			

EMC Performances

Total Item		Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (EMC Recommended Circuit 2-2)
		RE	CISPR22/EN55032	CLASS B (EMC Recommended Circuit 2-2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (EMC Recommended Circuit 2-1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (EMC Recommended Circuit 2-1)
		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 & Interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

Mechanical Dimensions



Note:
Unit: mm
General Tolerance:±1.0

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

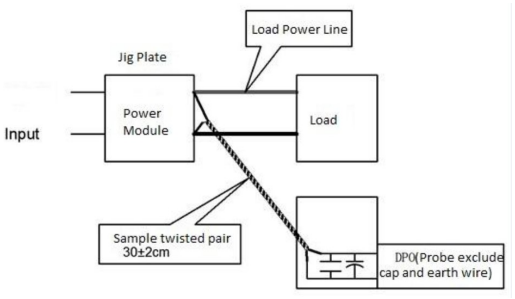
Pin function description

Pin No.	1	2	3	4	5	6	7	8
Dual output	AC(L)	AC(N)	+Vc	-Vc	-Vo1	+Vo1	-Vo2	+Vo2

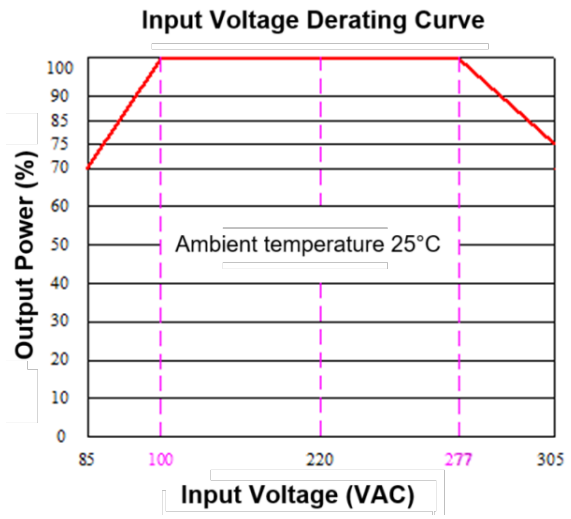
Ripple& Noise Test Instruction (Twisted Pair Method)

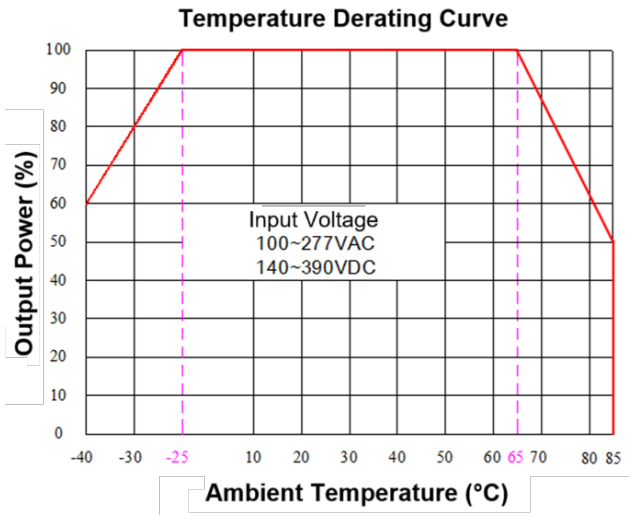
1) Ripple noise test need 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 4.7uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.

2) Please refer to the output ripple noise test diagram. The power supply output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be started after input power on.



Product Performance Curves





Note 1: The power supply output power should respect the Derating Curve when the input voltage is at 85~100VAC/277~305VAC & 120~140VDC/ 390~430VDC.

Note 2: This product should operate at a natural air environment. Please contact us if it is used at a closed space.

Typical Application Circuit and EMC Recommended Circuit

1.Typical Application Circuit

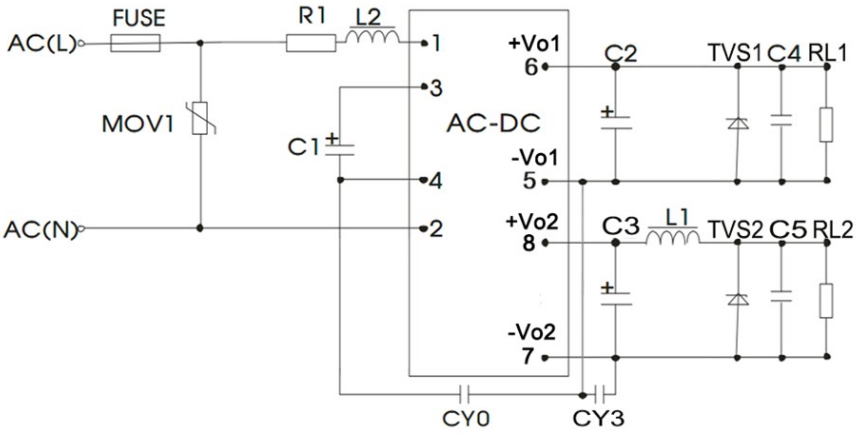


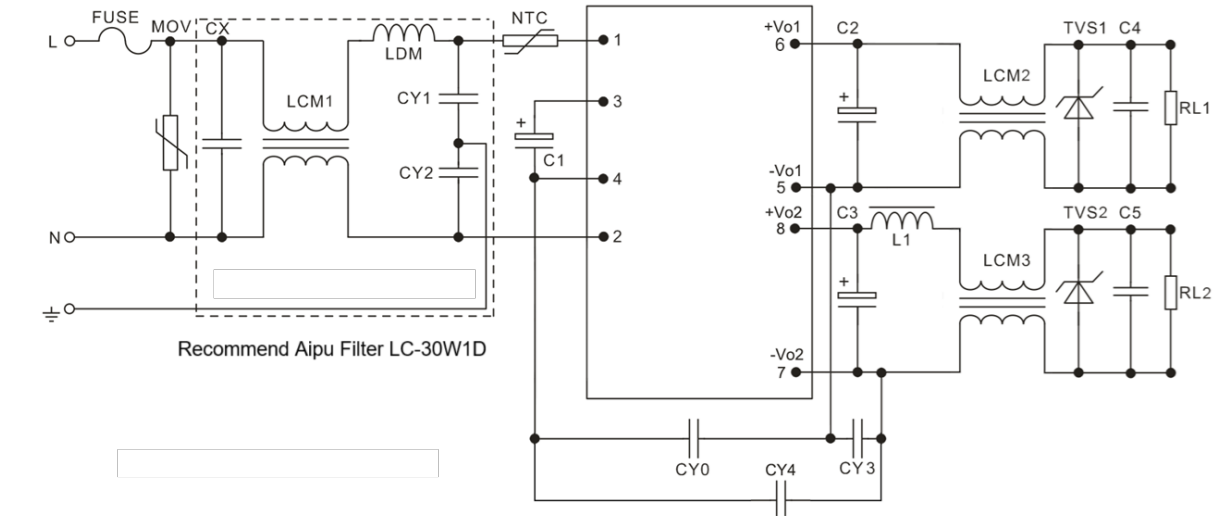
Figure 1

Part No.	C1	R1	C2 (Solid Cap)	L1	C3 (Solid Cap)	C4/C5	L2	CY0	CY3	FUSE	TVS1	TVS2
DA5-220E0512GA9N4	22uF /450V	12Ω /2W	100uF /16V	2uH	220uF/25V	0.1uF /50V	1mH /1A	1nF /400V	1nF /250V	1A /300V	SMBJ 7.0A	SMBJ20A
DA5-220E0524GA9N4					220uF/35V							SMBJ30A

Note:

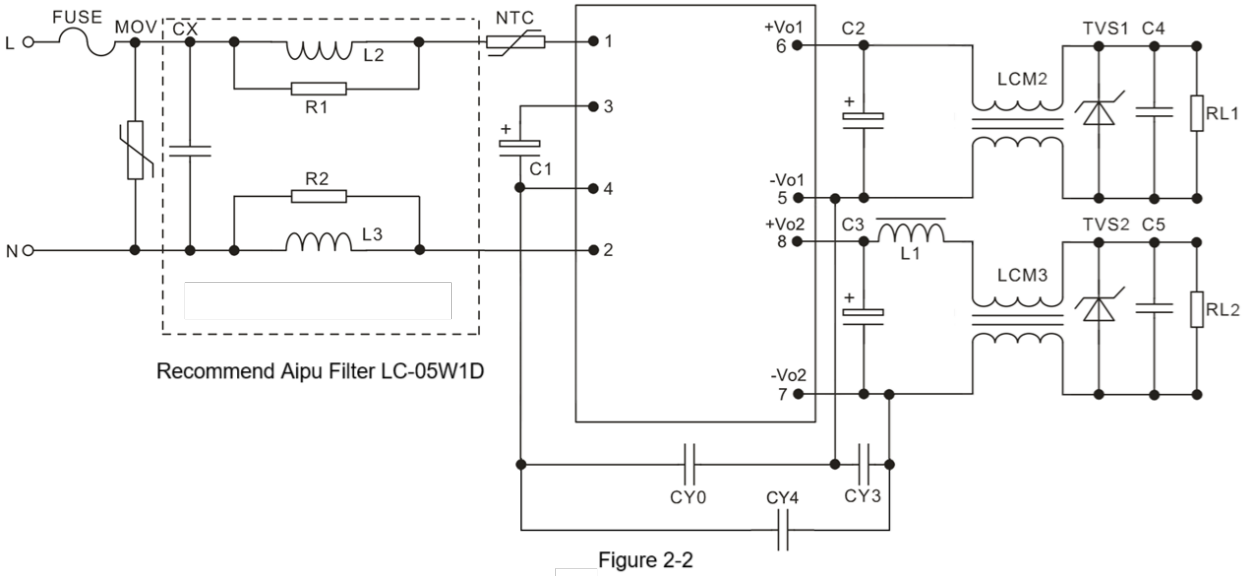
1) C1, R1, C2, L1, C3 & Fuse are not optional.

2. EMC recommended circuit (Used for higher EMC requirement)



Recommend Aipu Filter LC-30W1D

Figure 2-1



Recommend Aipu Filter LC-05W1D

Figure 2-2

FUSE	Recommend 1A/300V (Not optional)	NTC	5D-9
MOV	14D561K	CY1,CY2,CY4	1nF/400VAC
CX	Recommend 0.1uF/275Vac	LDM	330uH/1A
LCM1	40mH Min	L2, L3	Color ring inductor 1mH/ 1W
LCM2/LCM3	40mH Min	R1, R2	2.2KΩ, above 1/8W

Note 1:

1. The product should be used according to the specifications in this manual, otherwise it could be permanently damaged.
2. A fuse should be used at input.
3. The product performances in this manual cannot be guaranteed if it works at a lower load than the minimum load condition.
4. The product performances in this manual cannot be guaranteed if it works at over-load.
5. Unless otherwise specified, all values or indicators in this manual are tested at Ta=25℃, humidity<75%RH, rated input voltage and rated load (pure resistance load).
6. All values or indicators in this manual had been tested based on Aipupower test specifications.
7. The specifications are specially for the parts listed in this manual, any other non-standard models performances could be out of the specifications. Please contact our technician for specific requirement.
8. Aipupower can provide customization service.
9. The product specifications may be modified without a prior notice. Please refer to the published data sheet in Aipupower website.

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