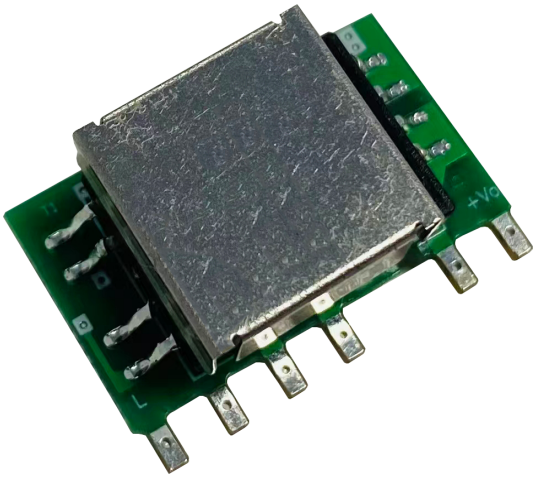
AC/DC Converter
DA5-220SXXG9D4 Series

Typical Features

- ◆ Wide input voltage range 85-305VAC/70-430VDC
- ◆ No load power consumption ≤ 0.3W
- ◆ Efficiency up to 78%(TYP.)
- ◆ Operating Temperature from -40℃ to +105℃
- ◆ Switching Frequency 65KHz
- ◆ Short circuit protection & over current protection
- ◆ Isolation voltage 3600VAC
- ◆ Altitude during operating 4000m Max
- ◆ Compliant with IEC/EN62368/UL62368/EN61558
- ◆ Conform to CE
- ◆ Mini size open-frame, industrial level design
- ◆ PCB SIP mounting



Application Field

DA5-220SXXG9D4 Series----- *Mini size & open-frame AC-DC power supplies with global adapted input voltage range both AC & DC available, low ripple, low temperature rise, low standby power consumption, high efficiency, high reliability, safety isolated and good EMC performance. This series of products can be widely used in the fields of Electric power, industry, instrument and smart home devices, etc. The additional circuit for EMC is recommended in this data sheet for the application with higher EMC requirement.*

Typical Product List

Certificate	Part No.	Output Specifications			Capacitive Load @220Vac	Ripple& Noise @20MHz (Max)	Efficiency@ Full Load, 220Vac (Typical)
		Power	Voltage	Current			
		(W)	Vo(V)	Io(mA)	uF (Max)	mVp-p	%
-	DA5-220S3V3G9D4	3.3	3.3	1000	2000	100	68
	DA5-220S05G9D4	5	5	1000	2000	100	74
	DA5-220S09G9D4	5	9	556	1000	120	76
	DA5-220S12G9D4	5	12	416	400	120	78
	DA5-220S12V1G9D4	5	12.1	416	400	120	78
	DA5-220S15G9D4	5	15	333	300	120	78
	DA5-220S24G9D4	5	24	208	200	120	80

Note 1 - * marked part has been 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 should be in ±2% of the typical value in this table. The efficiency = the output power/the input power*100%

Note 4 - The ripple and noise are tested by the twisted pair method, please refer to the following Ripple & Noise Test Instruction.

Note 5 - Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

Input Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Input Voltage Range	AC input	85	220	305	VAC
	DC input	70	310	430	VDC
Input Frequency range	-	47	50	63	Hz
Input Current	115VAC	-	-	0.15	A
	220VAC	-	-	0.10	
Surge Current	115VAC	-	-	11	
	220VAC	-	-	21	
No-load power consumption	Input 115VAC	-	-	0.3	W
	Input 220VAC	-	-		
Leakage Current	-	0.25mA TYP/230VAC/50Hz			
Recommended External Fuse	-	1A-3A/300VAC Time-delay fuse			
Hot Plug	-	Unavailable			
Remote Control	-	Unavailable			

Output Specifications

Item		Operating Condition			Min	Typ.	Max	Unit
Voltage Accuracy		Full input voltage range, 10-100% load (the unit can work stable at <10% load)	Vo	3.3V	-	±2.0	±8.0	%
				Others	-	±2.0	±6.0	%
Line Regulation		Rated load		Vo	-	±1.0	±2.0	%
Load Regulation		Rated input voltage, 20%~100% load		Vo	-	±1.0	±5.0	%
Minimum Load		Single Output			10	-	-	%
Turn-on Delay Time		Input 115VAC (full load)			-	600	-	mS
		Input 220VAC (full load)						
Power-off Hold up 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	-	+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
Ripple & Noise		Full input voltage range			-	50	120	mV

General Specifications

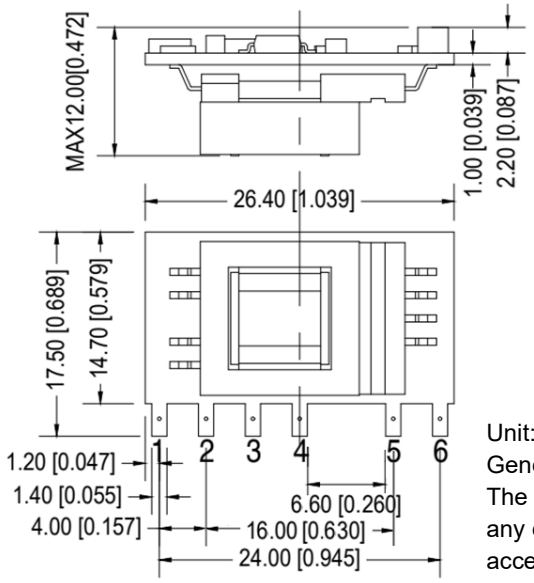
Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz

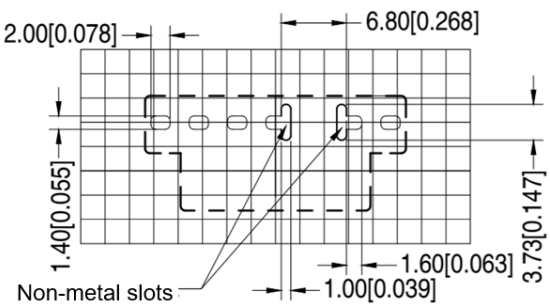
Operating Temperature		Refer to the Temperature Derating Curve	-40	-	+105	℃
Storage Temperature		-	-40	-	+110	
Soldering Temperature		Wave soldering	260±4℃, time 5-10S			
		Manual soldering	360±8℃, time 4-7S			
Relative Humidity		-	10	-	90	%RH
Isolation Voltage	I/P-O/P	Dielectric test 1min, leakage current ≤5mA	3600	-	-	VAC
Insulation Resistance	I/P-O/P	@ DC500V	100	-	-	MΩ
Safety Standard		-	EN62368, IEC62368			
Vibration		-	10-55Hz,10G, 30 Min, along X,Y,Z			
Safety Class		-	CLASS II			
MTBF		MIL-HDBK-217F @25℃	＞300,000H			
Unit Weight		-	5g（TYP）			

EMC Performance

Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with Recommended Circuit 2)
		RE	CISPR32/EN55032	CLASS B (with Recommended Circuit 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (with Recommended Circuit 2)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (with Recommended Circuit 2)
		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

Mechanical Dimensions





PCB layout Vertical View (Grid 2.54x2.54mm)

Unit: mm[inch]
General tolerance ±1.00[±0.039]
The components layout is only for reference, any deviation from the actual unit should be accepted.

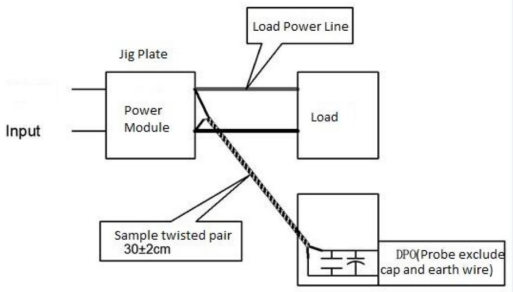
Pin No.	Function
1	L(input)
2	N(input)
3	Vcap+
4	Vcap-
5	Vout-
6	Vout+

Packaging Code	L x W x H	
-	26.4 x 17.5 x 12.0 mm	1.039 × 0.689 × 0.472 inch

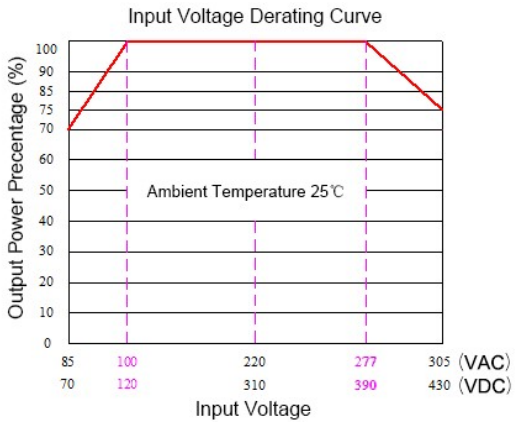
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHZ bandwidth)

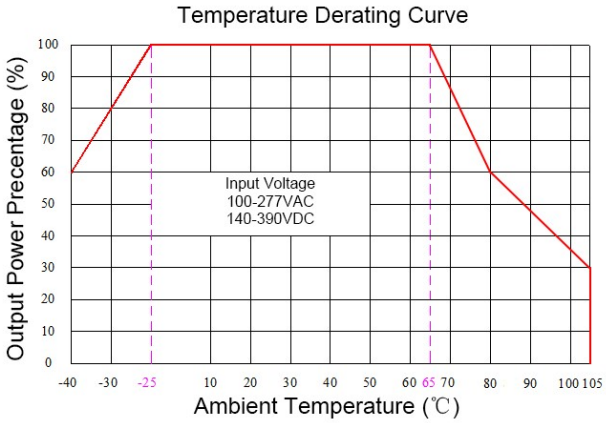
1) Ripple noise test need 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.

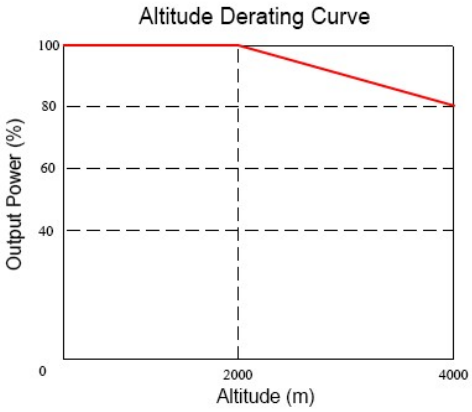
2) The output ripple noise test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location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



Product Performance Curves





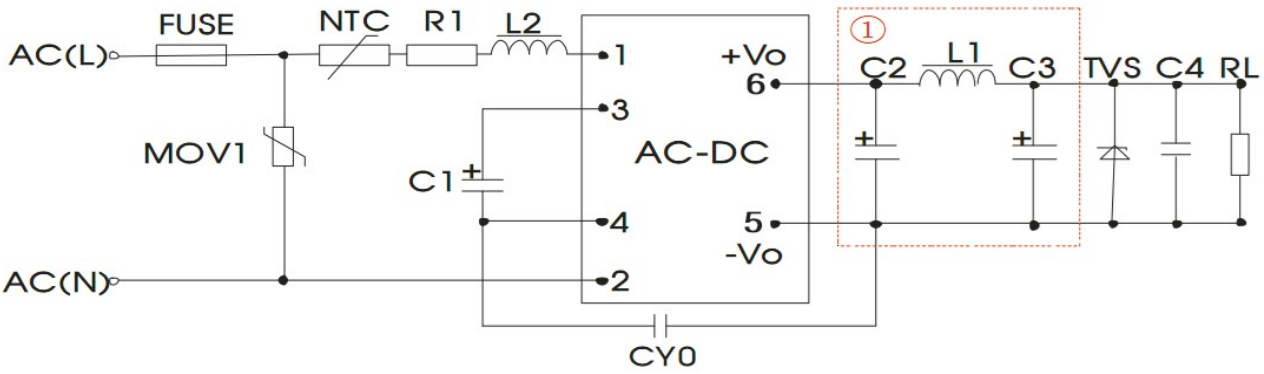


Note 1 - The output power should be derated based on the input voltage derating curve at 85~100VAC/277~305VAC/70~120VDC/390~430VDC.

Note 2 - This product should operate at a natural air condition, please contact us if it need be used at a closed space.

Recommended Circuits for Application

1.Typical Application Circuit



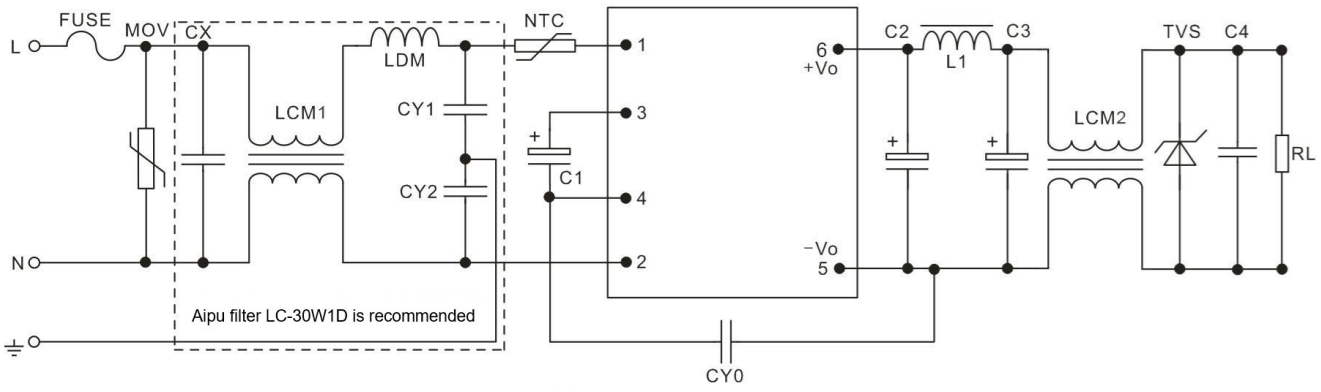
Circuit 1

(Note ① is π Type filter)

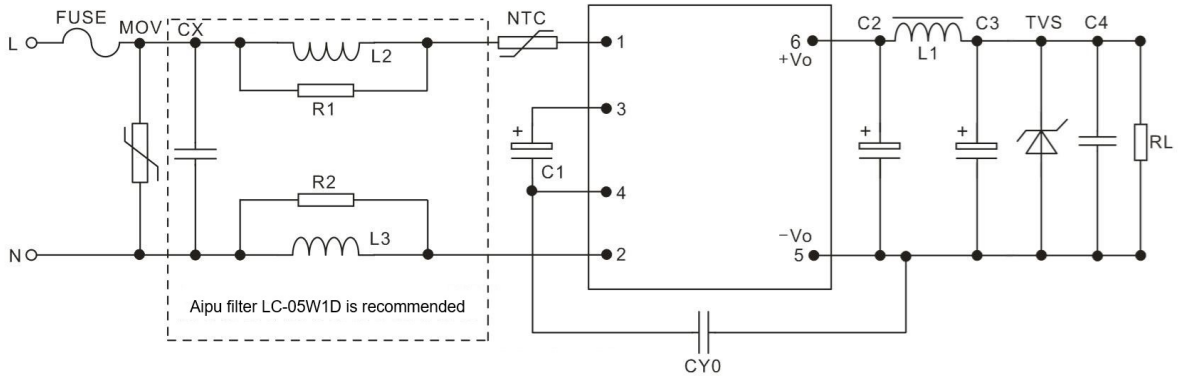
Product No	C1 (*)	C2 (* solid-state capacitor)	L1 (*)	C3 (* soild-state capacitor)	C4	L2	NTC	CY0	FUSE (*)	TVS
DA5-220S3V3G9D4	22uF /450V	470uF/10V	2.0uH /2A	100uF/10V	0.1uF /50V	4.7mH /0.3A	5D-9	Y1 /102M /400V	1A/300V, Time-delay fuse	SMBJ7.0A
DA5-220S05G9D4		470uF/10V		100uF/10V						SMBJ7.0A
DA5-220S09G9D4		220uF/16V		220uF/16V						SMBJ12A
DA5-220S12G9D4		220uF/16V		68uF/16V						SMBJ20A
DA5-220S12V1G9D4		220uF/16V		68uF/16V						SMBJ20A
DA5-220S15G9D4		220uF/35V		68uF/35V						SMBJ20A
DA5-220S24G9D4		100uF/35V		47uF/35V						SMBJ30A

Note - * marked component is necessary, not optional.

2. Recommended circuit for high EMC requirement



Circuit 2-1



Circuit 2-2

FUSE	1A/ 300V (Necessary)	NTC	5D-9
MOV	10D561K/3500A	CY1, CY2	Y1/1nF/400VAC
CX	X2/224K/310Vac	LDM	330uH/ 0.3A
LCM1	40mH min/0.3A	L2, L3	Color-ring inductor 1mH/0.3A
LCM2	40uH min/2A	R1, R2	2.2KΩ/ >1/8W

Application Notice

1. The products should be used according to the specifications in this data sheet, otherwise it could be permanently damaged.
2. A fuse should be connected at input.
3. The product performance in this data sheet cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance in this data sheet cannot be guaranteed if it works at over-load condition.
5. Unless otherwise specified, all values or indicators in this data sheet are tested at Ta=25℃, humidity<75%RH, rated input voltage and rated load (pure resistance load).
6. All values or indicators in this data sheet had been tested based on Aipupower test specifications.
7. The specifications are specially for the parts listed in this data sheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
8. Aipupower can provide customization service.

Guangzhou Aipu Electron Technology Co., Ltd
Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China.
Tel: 86-20-84206763 Fax: 86-20-84206762 HOTLINE: 400-889-8821
E-mail: sales@aipu-elec.com Website: https://www.aipupower.com