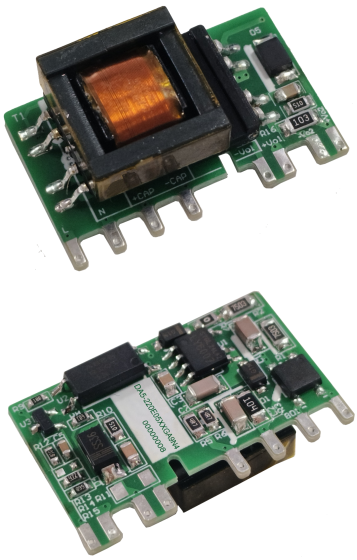
Typical Features

- ◆ Wide input voltage range 85-305VAC/120-430VDC
- ◆ No load power consumption ≤0.35W@220VAC
- ◆ Efficiency 78% (Typ.)
- ◆ Operating temperature from -40°C to +85°C
- ◆ Switching frequency 65KHz
- ◆ Short circuit & over current protections
- ◆ Isolation voltage 3600VAC
- ◆ Altitude during operation 4000m Max
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ With CE certificate
- ◆ Mini size open-frame, industry level design
- ◆ PCB SIP mounting



EN62368-1

Application Field

DA5-220EXXXXGA9N4 Series ----- Mini size open-frame 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, Industrial, Instrument, Smart home devices, etc. Additional circuit diagram for EMC is recommended for the application with high EMC requirements.

Typical Product List

Certificate	Part No.	Input Voltage		Output Specification					Max Capacitive Load @220VAC	Ripple & Noise 20MHz (Max)	Efficiency @Full load 220VAC (Typ.)
		Nom	Range	Power	Voltage Vo1	Current Io1	Voltage Vo2	Current Io2			
		(VAC)		(W)	(VDC)	(mA)	(VDC)	(mA)	(uF)	mVp-p	%
CE	DA5-220E0512GA9N4	220	85-305	5	5	200	12	330	1000/1000	100/100	78
	DA5-220E0524GA9N4				5	200	24	167	1000/220	100/100	78

Note 1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 2: The full load efficiency 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 3: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.

Input Specifications

Item	Test 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

Standby power consumption	Input 115VAC	-	-	0.35	W
	Input 220VAC	-	-		
Input current	Input 115VAC	-	-	0.15	A
	Input 220VAC	-	-	0.08	
Surge current	Input 115VAC	-	-	11	A
	Input 220VAC	-	-	21	
Leakage current	-	0.5mA TYP/230VAC/50Hz			
Hot-plug	-	Unavailable			
External fuse recommended	-	2A/300VAC Time-delay fuse			
ON/OFF Control	-	Unavailable			

Output Specifications

Item		Test Condition		Min.	Typ.	Max.	Unit
Output voltage accuracy		Full input voltage range, any load	Vo1	-	±2.0	±3.0	%
			Vo2	-	±2.0	±5.0	%
Line regulation		Rated Load	Vo1	-	±0.5	±1.0	%
			Vo2	-	±0.5	±2.0	%
Load regulation		Nominal input voltage, 20%~100% load	Vo1	-	±0.5	±1.0	%
			Vo2	-	±0.5	±2.0	%
Dynamic response	Overshoot range	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
	Recovery time			-	-	5.0	mS
Minimum load		Dual outputs isolated		10	-	-	%
Temperature drift coefficient		-		-	-	±0.03	%/℃
Turn-on delay time		Input 115VAC (full load)		-	-	1000	mS
		Input 220VAC (full load)		-	-		
Power-off hold up time		Input 115VAC (full load)		-	50	-	mS
		Input 220VAC (full load)		-	80	-	
Output overshoot		Full input voltage range		≤10			%Vo
Short circuit protection				Continuous, Self-recovery			Hiccup
Over current protection		Input 220VAC		120	-	200	%Io
Ripple & Noise		5%-100% load, 20MHz	Vo1/Vo2	-	-	100/100	mVp-p

Note: The Ripple & Noise is tested by the Parallel-line method, please refer to the following test instruction.

General Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Switching frequency	-	-	65	-	KHz
Operating temperature	Refer to the temperature derating graph	-40	-	+85	℃
Storage temperature	-	-40	-	+105	℃
Soldering temperature	Wave-soldering	260±4℃, timing 5-10S			
	Manual-soldering	360±8℃, timing 4-7S			
Relative humidity	-	10	-	90	%RH

Isolation voltage	I/P-O/P	Test 1min, leakage current <5mA	3600	-	-	VAC
	Vo1-Vo2	Test 1min, leakage current <5mA	500	-	-	VDC
Insulation resistance	I/P-O/P	@DC500V	100	-	-	MΩ
MTBF	MIL-HDBK-217F@25℃		300	-	-	K Hours
Safety standard	-		EN62368, IEC62368			
Vibration	-		10-55Hz,10G, 30Min, along X, Y, Z			
Safety class	-		CLASS Ⅱ			

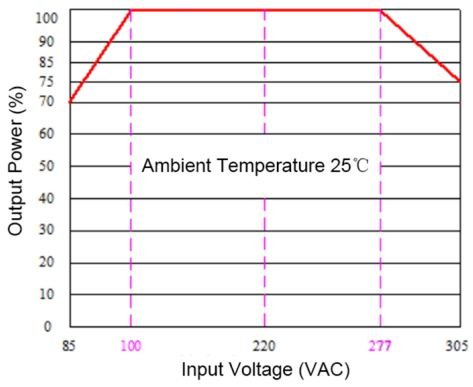
Weight & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H	
	-	6g	29.54 x 18.55 x 12.00 mm	1.163 × 0.730 × 0.472 inch

EMC Performances

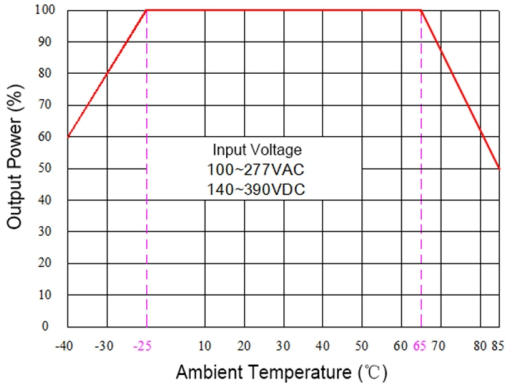
Items			Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the recommended circuit 2)
		RE	CISPR32/EN55032	CLASS B (with the recommended circuit 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf. Criteria B (with the recommended circuit 1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf. Criteria B (with the recommended circuit 1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf. Criteria B
		Surge	IEC/EN61000-4-5	Line to line ±1KV Perf. Criteria B (with the recommended circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf. Criteria B
		Voltage dips & interruptions	IEC/EN61000-4-11	0%~70% Perf. Criteria B

Product Characteristics Graphs

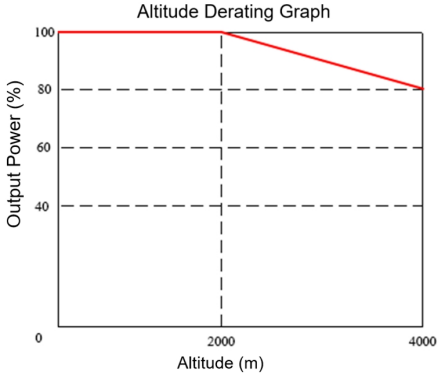
Input Voltage Derating Graph



Temperature Derating Graph



Altitude Derating Graph



Note 1: The output power should be derated based on the input voltage derating graph at 85~100VAC/120~140VDC & 277~305VAC/390~430VDC.

Note 2: This product should operate under the condition of nature air, please contact us if it could be used at a closed space.

Recommended Circuits for Application

1, Typical application circuit diagram

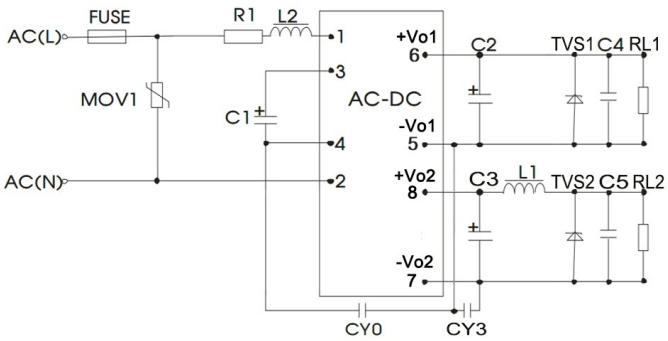


Figure – Circuit 1

Part No.	C1 (*)	R1 (*)	C2 (*)	L1 (*)	C3 (*)	C4/C5	L2	CY0	CY3	FUSE (*)	TVS1	TVS2
DA5-220E0512 GA9N4	22uF 450V	12Ω 2W	100uF 16V	2uH 0.8A	220uF /25V	0.1uF 50V	1mH 0.5A	Y1 102M 400VAC	Y1 102M 250VAC	1A 300VAC Time-delay fuse	SMBJ 7.0A	SMBJ 20A
DA5-220E0524 GA9N4					220uF /35V							SMBJ 30A

Note: All the * marked components are required for the application. Solid-state capacitors are recommended for C2&C3.

2, Recommended EMC circuits diagrams (for high EMC requirements)

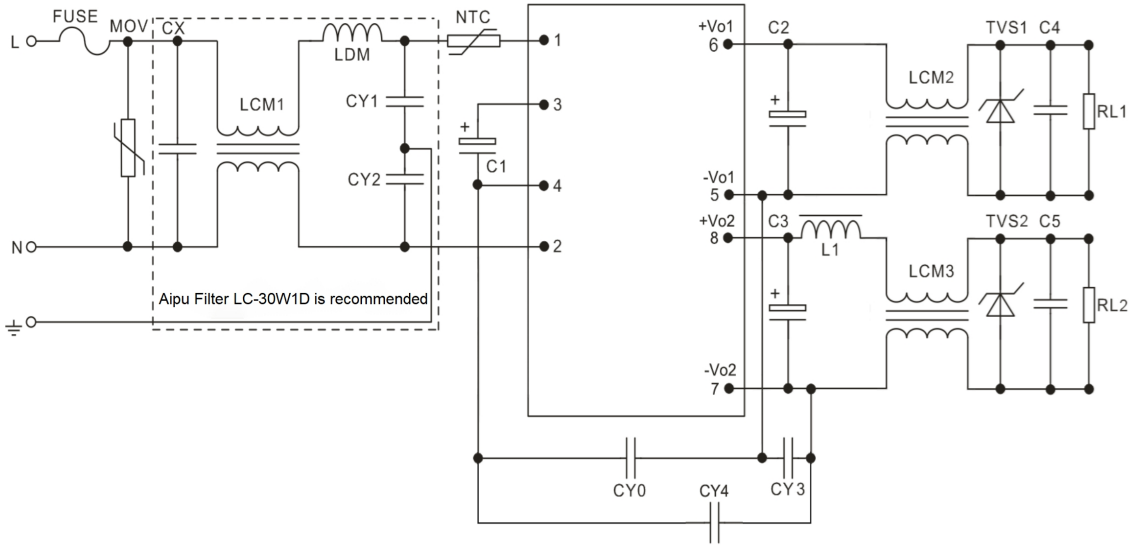
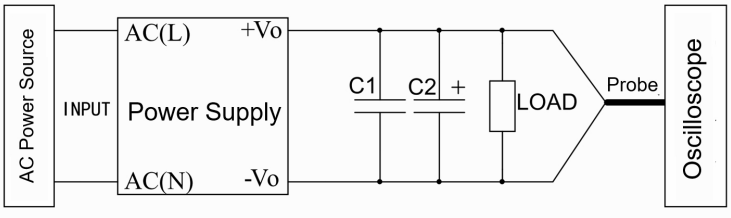


Figure – Circuit 2

FUSE	T2A/300V (Required)	NTC	5D-9
MOV	14D561K/4500A	CY1, CY2, CY4	Y1/102M/400VAC
CX	X2/102K/310VAC	LDM	330uH/1A
LCM1	40mH/0.3A	LCM2/LCM3	40uH/0.3A

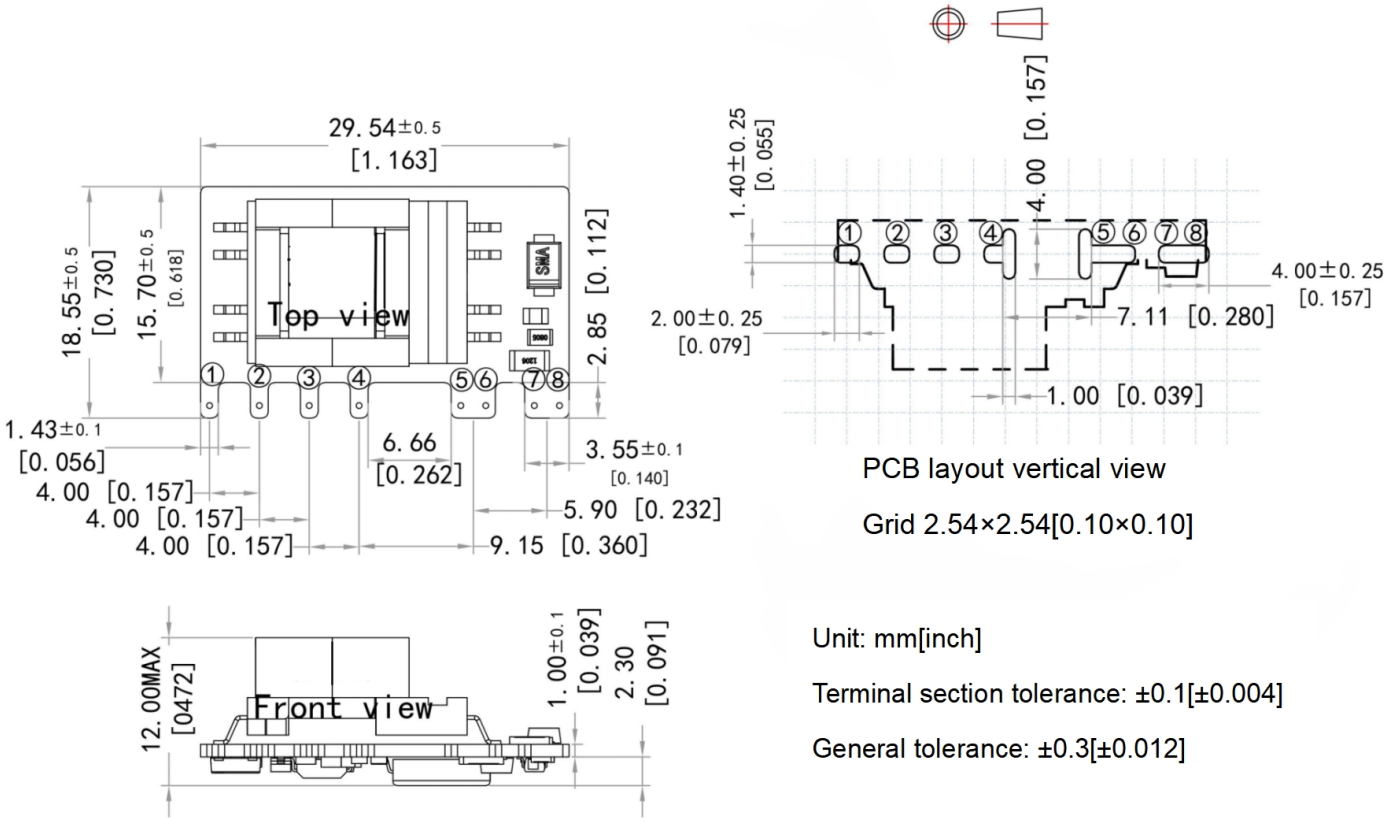
Note: The other components not mentioned in above table should refer to the typical application recommendation.

Ripple & Noise Test Instruction (Parallel-line Method, 20MHZ bandwidth)



1. The Ripple & Noise test needs the cables in parallel, an oscilloscope that should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. One polypropylene capacitor C1(0.1uF) and one high-frequency low-impedance electrolytic capacitor C2(10uF) are connected in parallel with the probe.
2. Refer to the test diagram, 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 test can start at the converter output terminals after the input power on.

Mechanical Dimensions



Terminal Function Description

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

Application Notice

1.The product should be used according to the specifications, otherwise it could be permanently damaged.

2. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.

3. The product performance cannot be guaranteed if it works under over-load condition.

4. Unless otherwise specified, all values or indicators on this datasheet are tested at Ta=25℃, humidity<75%RH, nominal input voltage and rated load (pure resistance load).

5. All values or indicators on this datasheet have been tested based on Aipupower test specifications.

6.The specifications are specially for the parts listed on this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.

7. Aipupower can provide customization service.

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