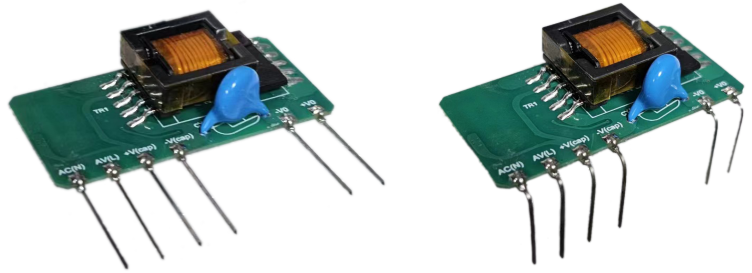


Typical Features

- ◆ Wide input voltage range 85-528VAC/120-746VDC
- ◆ No load power consumption $\leq 0.2W$ (@230VAC)
- ◆ Efficiency 80% Typ. (@230VAC)
- ◆ Operating temperature from $-40^{\circ}C$ to $+105^{\circ}C$
- ◆ Switching Frequency 65KHz (Typ.)
- ◆ Short circuit & over-current protections
- ◆ Isolation voltage 4000VAC
- ◆ Altitude during operating 4000m Max
- ◆ PCB SIP mounting



Application Field

DA5-300SXXG9N4(-1) Series ----- Compact size, high efficiency open-frame power supplies with wide input voltage range (both AC and DC available), low ripple, low temperature rise, low standby power consumption, high efficiency, high reliability, safety isolated and compliance with IEC/EN62368/UL62368 standards. This series of products can be widely used in the fields of industry, office devices, electric power and household devices, etc. The additional circuit for EMC is recommended in this data sheet for the application with high EMC requirement.

Typical Product List

Certificate	Part no.	Output Specifications			Capacitive Load 230VAC(MAX) (uF)	Ripple & Noise 20MHz (MAX) (mVp-p)	Efficiency@ Full Load 230VAC % (Typ.)
		Power	Voltage	Current			
		(W)	Vout (V)	Iout (mA)			
-	DA5-300S05G9N4(-1)	5	5	1000	3000	80	76
	DA5-300S09G9N4(-1)	5	9	555	3000	80	77
	DA5-300S12G9N4(-1)	5	12	420	2200	120	78
	DA5-300S15G9N4(-1)	5	15	333	1000	120	78
	DA5-300S24G9N4(-1)	5	24	210	600	120	80

Note 1 - The Ripple & Noise test should be tested with additional circuit.

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 minimum efficiency should be -2% of the typical value.

Note 4 - Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

Note 5 - The suffix -1 indicates the part with pins 90°bended.

Input Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Input Voltage Range	AC input	85	230	528	VAC
	DC input	120	325	746	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	115VAC	-	-	0.15	A
	230VAC	-	-	0.10	
Surge Current	115VAC	-	-	10	

	230VAC	-	-	17	
No-load power consumption	Input 230VAC	-	-	0.2	W
	Input 480VAC	-	-	0.5	
External fuse	-	2.0A/500VAC, Time-delay fuse (necessary)			
leakage current	-	0.25mA TYP/ 230VAC/ 50Hz			
Hot-plug	-	unavailable			
Remote Control	-	unavailable			

Output Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit	
Voltage Accuracy	Full input voltage range, any load	-	±1.0	±2.0	%	
Line Regulation	Rated Load	-	-	±0.5	%	
Load Regulation	Nominal input voltage, 20%~100% load	-	-	±0.5	%	
Minimum Load	Single Output	0	-	-	%	
Turn-on Delay Time	Input 230VAC (full load)	-	500	-	mS	
Power-off Hold up Time	Input 400VAC (full load)	-	100	-	mS	
Dynamic Response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-5.0	-	+5.0	mS
Output Over-shoot	Full input voltage range	≤10%Vo			%	
Short circuit protection		Continuous, self-recovery			Hiccup	
Drift Coefficient	-	-	±0.03%	-	%/°C	
Over Current Protection	Full input voltage range	≥130% Io, self-recovery			Hiccup	
Ripple & Noise	Vout=5V	-	60	80	mV	
	Vout=9V	-	60	80		
	Vout=12V	-	80	120		
	Vout=15V	-	80	120		
	Vout=24V	-	80	120		

Note - The ripple & noise is tested by the twisted pair test method with the additional circuit (refer to the following test instructions)

General Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency	-	60	65	70	KHz
Operating Temperature	Refer to the temperature derating curve	-40	-	+105	°C
Storage Temperature	-	-40	-	+110	
Soldering Temperature	Wave-soldering	260±4°C, Time 5-10S			
	Manual-soldering	360±8°C, 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
Vibration	-	10-55Hz, 10G, 30Min, along X, Y, Z			
MTBF	-	MIL-HDBK-217F 25°C > 300,000H			
Unit weight	-	8g (TYP)			

EMC Performance

Total Item	Sub item	Test standards	Performance/Class	
EMC	EMI	CE	CISPR32/EN55022 CLASS B (with Recommend Circuit 2)	
		RE	CISPR32/EN55022 CLASS B (with Recommend Circuit 2)	
	EMS	ESD	IEC/EN 61000-4-2 ±4KV / ±8KV perf. Criteria B (with Recommend Circuit 1)	
		RS	IEC/EN 61000-4-3	10V/m perf. CriteriaB (with Recommend Circuit 2)
			EFT	IEC/EN 61000-4-4
		IEC/EN 61000-4-4		±4KV perf. Criteria B (with Recommend Circuit 2)
		Surge	IEC/EN 61000-4-5	Line to line ±1KV (with Recommend Circuit 1)
			IEC/EN 61000-4-5	Line to line ±2KV/line to ground ±4KV (with Recommend Circuit 2)
		CS	IEC/EN61000-4-6	10 Vr.m.s perf. Criteria B (with Recommend Circuit 2)

Mechanical Dimensions

44.50 [1.751] ±0.50
 1.00 [0.039]
 0.50 [0.020]
 5.08 [0.200]
 1 3 5 7 12 14
 38.10 [1.500]
 23.00 [0.906] ±0.50
 10.00 [0.394]
 Max 15.00 [0.591]
 0.80 [0.031]

Pin No. | Function
 1 | AC(N)
 3 | AC(L)
 5 | +Vin(CAP)
 7 | -Vin(CAP)
 12 | -Vout
 14 | +Vout

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.

(-1) Mechanical Dimensions

44.50 [1.751] ±0.50
 1.00 [0.039]
 0.50 [0.020]
 5.08 [0.200]
 1 3 5 7 12 14
 38.10 [1.500]
 23.00 [0.906] ±0.50
 10.00 [0.394]
 Max 15.00 [0.591]
 0.80 [0.031]

Pin No. | Function
 1 | AC(N)
 3 | AC(L)
 5 | +Vin(CAP)
 7 | -Vin(CAP)
 12 | -Vout
 14 | +Vout

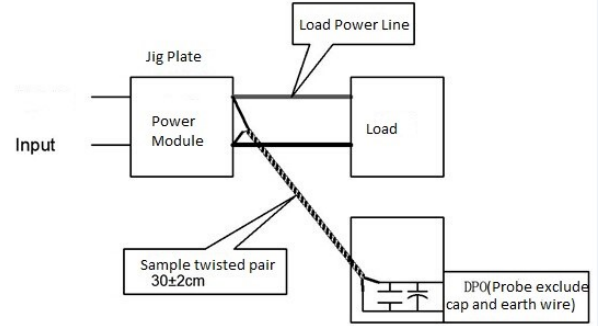
Unit: mm[inch]
 General tolerance ±1.00[±0.039]
 The components layout is only for reference, any deviation from the actual unit should be accepted.

Packaging Code	Dimensions L x W x H	
-	44.50X23.00X15.00 mm	1.752X0.906X0.591 inch

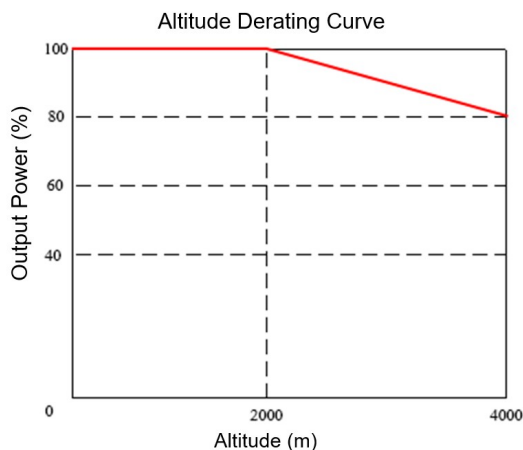
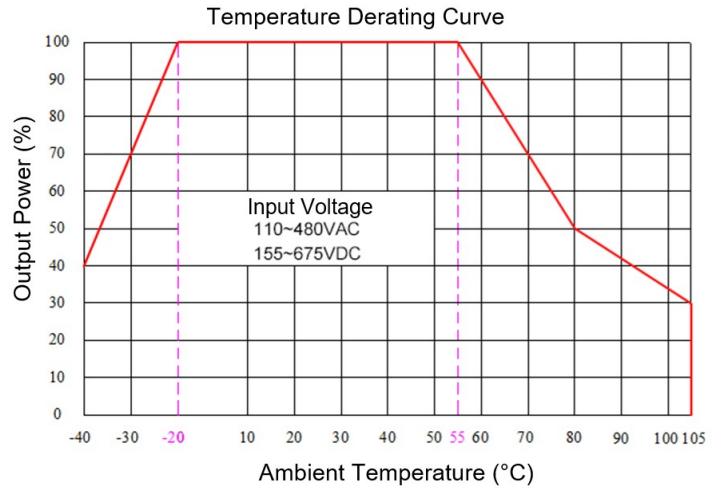
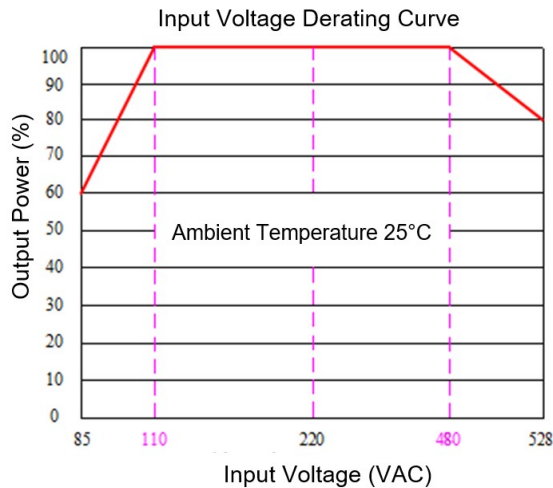
Ripple & Noise Test Instructions (Twisted Pair Method, 20MHz Bandwidth)

Test Method:

1. The 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 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 Curve

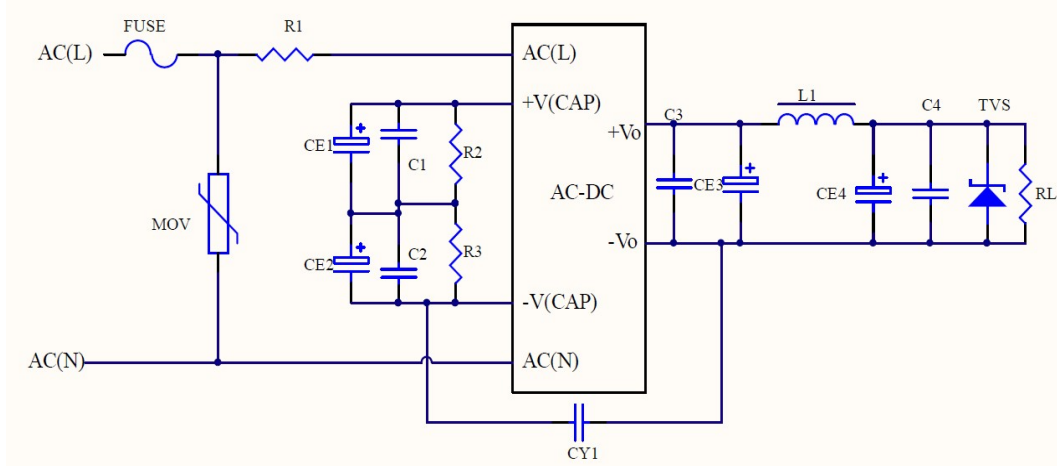


Note 1 - The output power should be derated based on the input voltage derating curve at 85~110VAC/480~528VAC & 120~155VDC/675~746VDC.

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

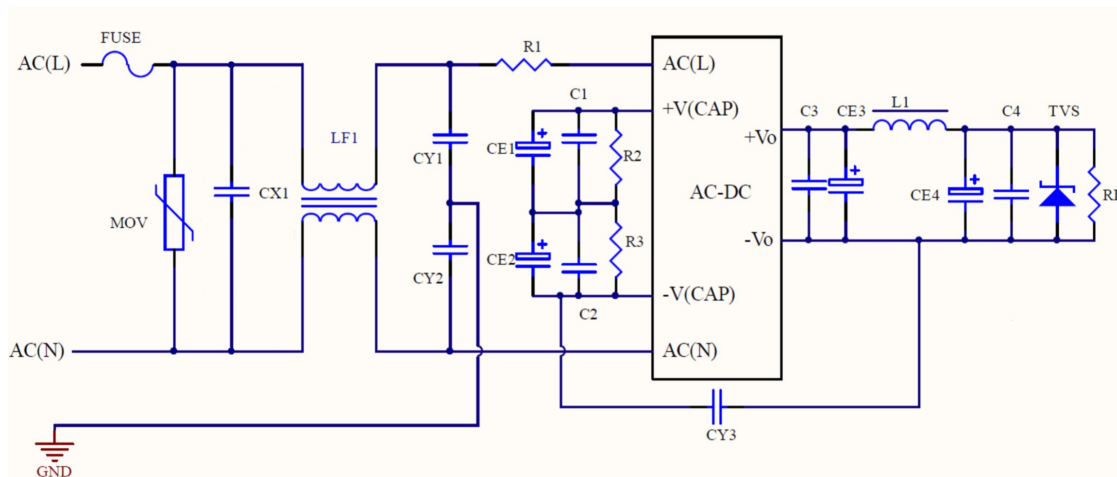
Recommended parameters

Part No.	CE3, CE4 (necessary)	C1, C2	C3, C4	L1 (necessary)	TVS
DA5-300S05G9N4	470uF/10V	0.1uF/630V	0.1uF/50V	4.7uH/3A	SMBJ7.0A
DA5-300S09G9N4	330uF/16V			4.7uH/3A	SMBJ12.0A
DA5-300S12G9N4	220uF/16V			4.7uH/3A	SMBJ20A
DA5-300S15G9N4	220uF/25V			4.7uH/3A	SMBJ20A
DA5-300S24G9N4	220uF/35V			5.6uH/3A	SMBJ30A

Note:

- 2A/500Vac time-delay fuse is recommended, necessary not optional.
- 14D102K/4500A Varistor is recommended for MOV which is necessary.
- 20Ω/1W wire-wound resistor is recommended for R1 which is necessary.
- 33uF/450V electrolytic capacitors are recommended for CE1 and CE2, both are necessary.
- 3MΩ/1206 is recommended for R2 and R3 as the discharge resistors, both are necessary.
- TVS is recommended to suppress the transient voltage.
- CY1 is a Y capacitor, Y1/470pF/500V is recommended (necessary).

2. Recommended EMC Circuit



Circuit 2

Recommended parameters:

1. 2A/500Vac time-delay fuse is recommended, necessary not optional.
2. 14D102K/4500A Varistor is recommended for MOV which is necessary.
3. 20Ω/1W wire-wound resistor is recommended for R1 which is necessary.
4. Y1/470pF/500VAC capacitors are recommended for CY1, CY2 & CY3 which are necessary.
5. X capacitor (X2/334K/530VAC) is recommended for CX1 which is necessary.
6. Common-mode Choke (15mH/0.5A) is recommended for LF1 which is necessary.

Note – the other components parameters can be same recommended as those in the table of typical application circuit 1.

Application Notice

1. The products should be used according to the specifications in this datasheet, otherwise it could be permanently damaged.
2. A fuse should be connected at input.
3. The product performance in this datasheet cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance in this datasheet cannot be guaranteed if it works under over-load condition.
5. Unless otherwise specified, all values or indicators in this datasheet are tested at Ta=25°C, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
6. All values or indicators in this datasheet had been tested based on Aipupower test specifications.
7. The specifications are specially for the parts listed in this datasheet, 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.

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