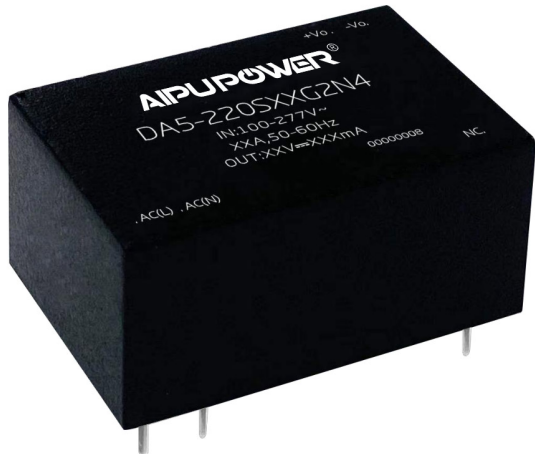


Typical Features

- ◆ Wide input voltage range 85-305VAC/120-430VDC
- ◆ No load power consumption $\leq 0.30\text{W}$
- ◆ Efficiency 82%(TYP.)
- ◆ Operating temperature from -40°C to 105°C
- ◆ Switching Frequency 65KHz
- ◆ Short circuit, over current & over temperature protections
- ◆ Isolation voltage 4000Vac
- ◆ Altitude during operating 4000m Max
- ◆ Encapsulated in plastic case, flame class UL94 V0
- ◆ PCB DIP mounting



Application Field

DA5-220SXXG2N4 Series ---- Compact size, high efficiency modular power supplies with global adapted input voltage range (both AC and DC available), low ripple, low temperature rise, low standby power consumption, high efficiency, high reliability, safety isolated and good EMC performance. This series of production 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 high EMC requirement.

Typical Product List

Certificate	Part No.	Output Specifications			Max Capacitive Load uF	Ripple& Noise 20MHz (Max) mVp-p	Efficiency @Full Load/220Vac (Typical) %
		Power	Voltage	Current			
		(W)	Vo(V)	Io(mA)			
-	DA5-220S05G2N4	5	5	1000	3000	100	73
	DA5-220S12G2N4	5	12	416	300	100	79
	DA5-220S15G2N4	5	15	333	200	120	79
	DA5-220S24G2N4	5	24	208	47	150	82

Note 1 - Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

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 $\pm 2\%$ 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, please refer to the following Ripple & Noise Test Instructions.

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	-	-	0.15	A
	220VAC	-	-	0.07	

Surge Current	115VAC	-	-	10	A
	220VAC	-	-	20	
No load consumption	Input 115VAC	-	-	0.30	W
	Input 220VAC	-	-		
Leakage Current	-	0.5mA TYP/ 230VAC/ 50Hz			
Recommended External Fuse	-	2A/ 300VAC Time-delay fuse			
Input capacitors CE1, CE2		3.3uF/450V			
Hot Plug	-	Unavailable			
Remote Control	-	Unavailable			

Output Specifications

Item		Operating Condition		Min	Typ.	Max	Unit
Voltage Accuracy		Full input voltage range, any load	Vo	-	±2.0	±5.0	%
Line Regulation		Rated load	Vo	-	-	±3.0	%
Load Regulation		Nominal input voltage, 20%~100% load	Vo	-	-	±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)		-	70	-	
Dynamic Response	Overshoot range	25%~50%~25%		-5.0	-	+5.0	%
	Recovery time	50%~75%~50%		-	5.0	-	mS
Output Overshoot		Full input voltage range		≤10%Vo			%
Short circuit Protection				Continuous, self-recovery			Hiccup
Temperature Drift		-		-	±0.03%	-	%/°C
Over Current Protection		Input 220VAC		≥120% Io self-recovery			Hiccup
Ripple & Noise		-		-	-	150	mV

General Specifications

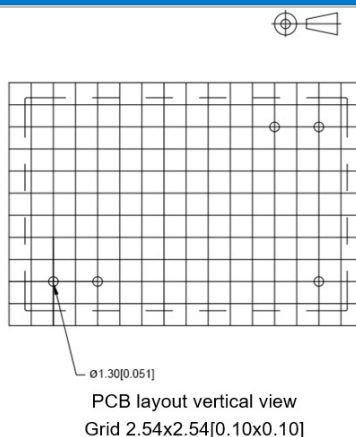
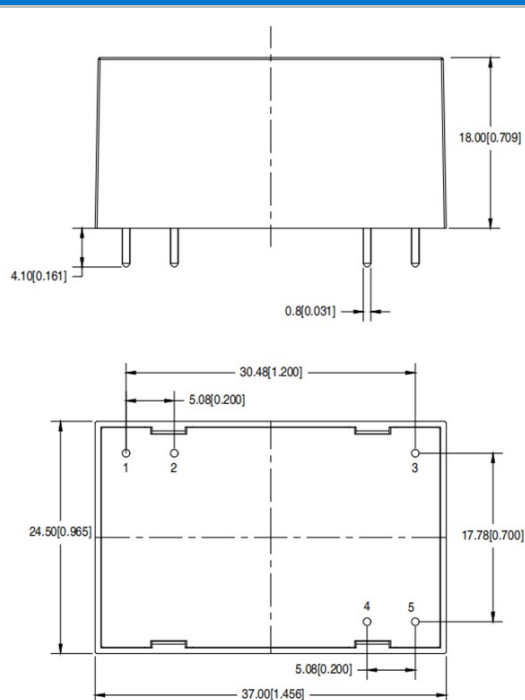
Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Refer to the Temperature Derating Curve	-40	-	+105	°C
Storage Temperature	-	-40	-	+110	
Soldering Temperature	Wave soldering	260±4°C, time 5-10S			
	Manual soldering	360±8°C, time 4-7S			
Relative Humidity	-	10	-	90	%RH

Isolation Voltage	I/P-O/P, Test 1min, leakage current ≤5mA	4000	-	-	VAC
Insulation Resistance	I/P-O/P, @ DC500V	100	-	-	MΩ
Safety Standard	-	IEC/EN62368			
Vibration	-	10-55Hz, 10G, 30Min, along X, Y, Z			
Safety Standard	-	CLASS II			
Flame Class of Case	-	UL94 V-0			
MTBF	-	MIL-HDBK-217F@25°C>300,000H			
Unit Weight	-	25g (TYP.)			

EMC Performances

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



Pin No.	Function
1	AC(L)
2	AC(N)
3	NC
4	+Vout
5	-Vout

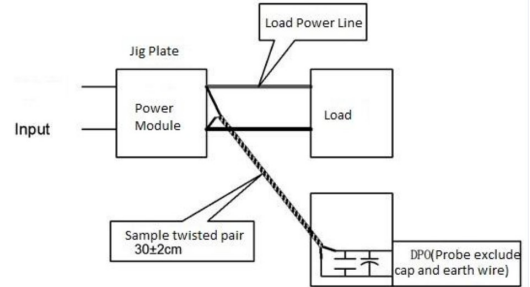
Unit: mm[inch]
Pin diameter tolerance $\pm 0.10[\pm 0.004]$
General tolerance $\pm 0.50[\pm 0.020]$

Packaging Code	Dimensions L x W x H	
G	37.0X24.5X18 mm	1.456X0.965X0.709 inch

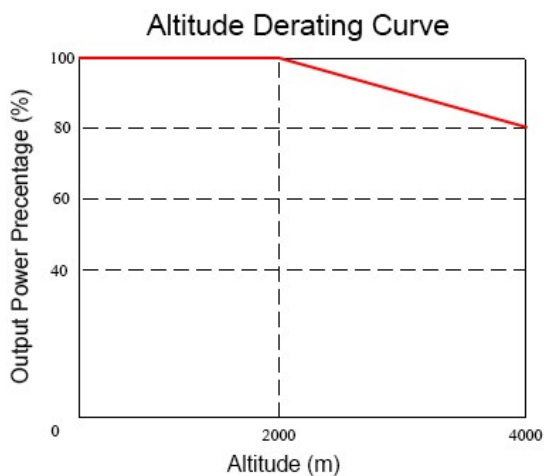
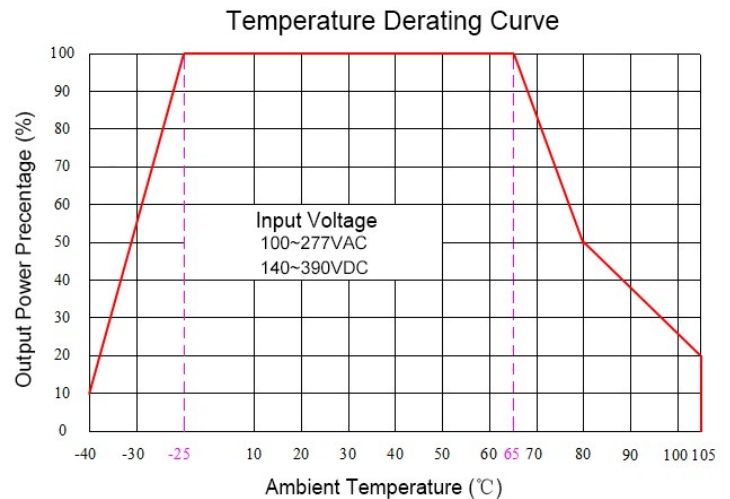
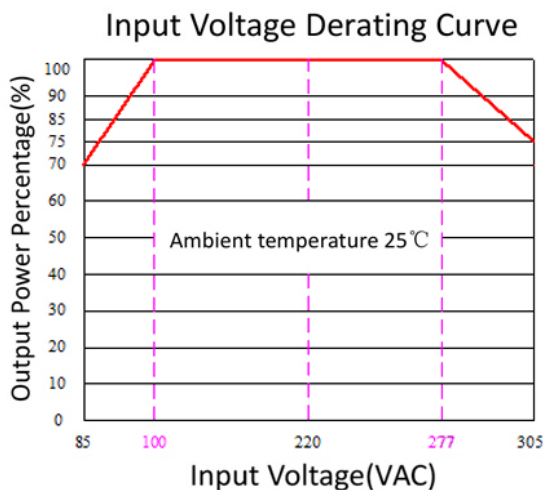
Ripple & Noise Test Instructions (Twisted Pair Method, 20MHz Bandwidth)

1) The Ripple & noise test needs 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.



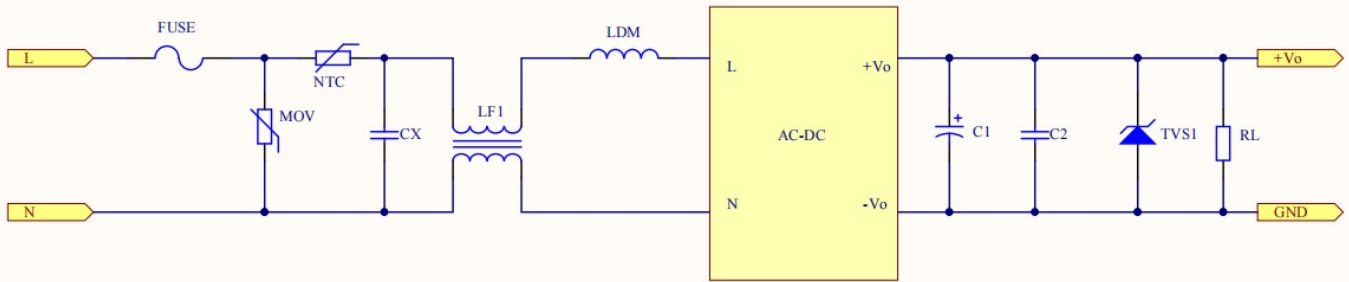
Product Performance Curves



Note 1 - The output power should be derated based on the input voltage derating curve at 85~100VAC/277~305VAC/120~140VDC/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 EMC Circuit for Application



Note:

- 1) 2A~300Vac time-delay fuse is recommended.
- 2) 14D561K/3500A is recommended for MOV.
- 3) 5D-11 is recommended for NTC which is to protect the converter against the lightning surge.
- 4) X capacitor, X2/104K/310VAC is recommended for CX.
- 5) LF1 is a common-mode chock, 25mH/0.3A is recommended.
- 6) LDM is a differential mode choke, 2mH/0.3A is recommended.
- 7) C1 capacitance should be less than the max capacitive load, a high frequency low ESR electrolytic capacitor is recommended, its withstand voltage should be more than 1.5X of output voltage.
- 8) 0.1uF ceramic SMD capacitor is recommended for C2 which withstand voltage should be more than 1.5X of output voltage.
- 9) TVS1 – SMBJ7.0A is recommended for 5V output, SMBJ12.0A for 9V output, SMBJ20A for 12V & 15V output, SMBJ30.0A for 24V output, SMBJ64A for 48V output.

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 $T_a=25^{\circ}\text{C}$, humidity<75%RH, rated 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.
9. The product specifications may be modified without prior notice. Please refer to the published data sheet at Aipupower website.

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