



Typical Features

- ◆ Wide input voltage range: 85-305VAC/120-430VDC
- ◆ No load power consumption ≤ 0.15W
- ◆ Transfer Efficiency 86%(TYP.)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over current, over voltage
- ◆ Isolation voltage: 4000VAC
- ◆ Meet IEC62368/UL62368/EN62368 test standard
- ◆ Pass CE, RoHS certificate
- ◆ Plastic case, UL94 V-0 class



Application Field

DA20-220SXXG2N4 Series----- a compact size, high efficient, pass CE power module offered by Aipu. It features universal input voltage range, AC and DC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation, good EMC performance. EMC and Safety standard meet international EN55032, IEC/EN61000. These series have important application for power, industry, instrument and smart home field. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

Typical Product List

Certificate	Part No	Output Specifications			Max. Capacitive Load (MAX)	Ripple & Noise 20MHz (MAX)	Full load efficiency, 220VAC (Typ.)
		Power	Voltage	Current			
		(W)	Vo(V)	Io(mA)			
CE/RoHS	DA20-220S05G2N4	20	+5	4000	8000	80	84%
CE/RoHS	DA20-220S12G2N4	20	+12	1666	5000	80	86%
CE/RoHS	DA20-220S15G2N4	20	+15	1330	3000	80	87%
CE/RoHS	DA20-220S24G2N4	20	+24	833	2000	100	88%

Note 1: The typical value of output efficiency is based on module is full loaded and burned-in after half an hour.

Note 2: The fluctuation range of full load efficiency(% ,TYP) in table is ±2%, full load efficiency= output power/module's input power.

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	100VAC	-	-	0.4	A
	220VAC	-	-	0.25	
Surge Current	100VAC	-	-	10	

	220VAC	-	-	20	
No Load Power Consumption	Input 115VAC	-	0.1	0.15	W
	Input 230VAC	-			
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
Recommended External Input Fuse	-	3.15A-5A/250VAC slow fusing			
Hot Plug	-	Unavailable			
Remote Control Terminal	-	Unavailable			

Output Specifications

Item		Operating Condition	Min	Typ.	Max	Unit
Voltage Accuracy		Full input voltage range, any load	-	±1.0	±2.0	%
Line Regulation		Nominal load	-	-	±0.5	%
Load Regulation		Nominal input voltage, 20%~100% load	-	-	±1.0	%
Minimum Load		Single Output	0	-	-	%
Start up Delay Time		Input 115VAC(full load)	-	500	-	mS
		Input 220VAC(full load)	-		-	
Power-off Holding Time		Input 115VAC(full load)	-	14	-	mS
		Input 220VAC(full load)	-	70	-	
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
Drift Coefficient		-	-	±0.03%	-	%/°C
Over Current Protection		Input 100-265VAC	≥130% Io self-recovery			Hiccup
Over Voltage Protection		Input 5.0VDC	≤10			VDC
		Input 12VDC	≤18			
		Input 15VDC	≤20			
		Input 24VDC	≤30			
Ripple & Noise		-	-	80	100	mV
		Note 1: Ripple & noise is tested by Twisted Pair Method, for details please check "Ripple & Noise Test" at back.				

General Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+75	°C

		Base on temperature derating curve, see Product Characteristic Curve at back.				
Storage Temperature	-	-40	-	+85		
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	Test 1min, leakage current≤5mA	4000	-	-	VAC
Insulation Resistance		@ DC500V	100	-	-	MΩ
Safety Standard	-	EN60950、IEC60950				
Vibration	-	10-55Hz,10G,30Min,alongX,Y,Z				
Safety Class	-	CLASS II				
MTBF	-	MIL-HDBK-217F 25℃>300,000H				

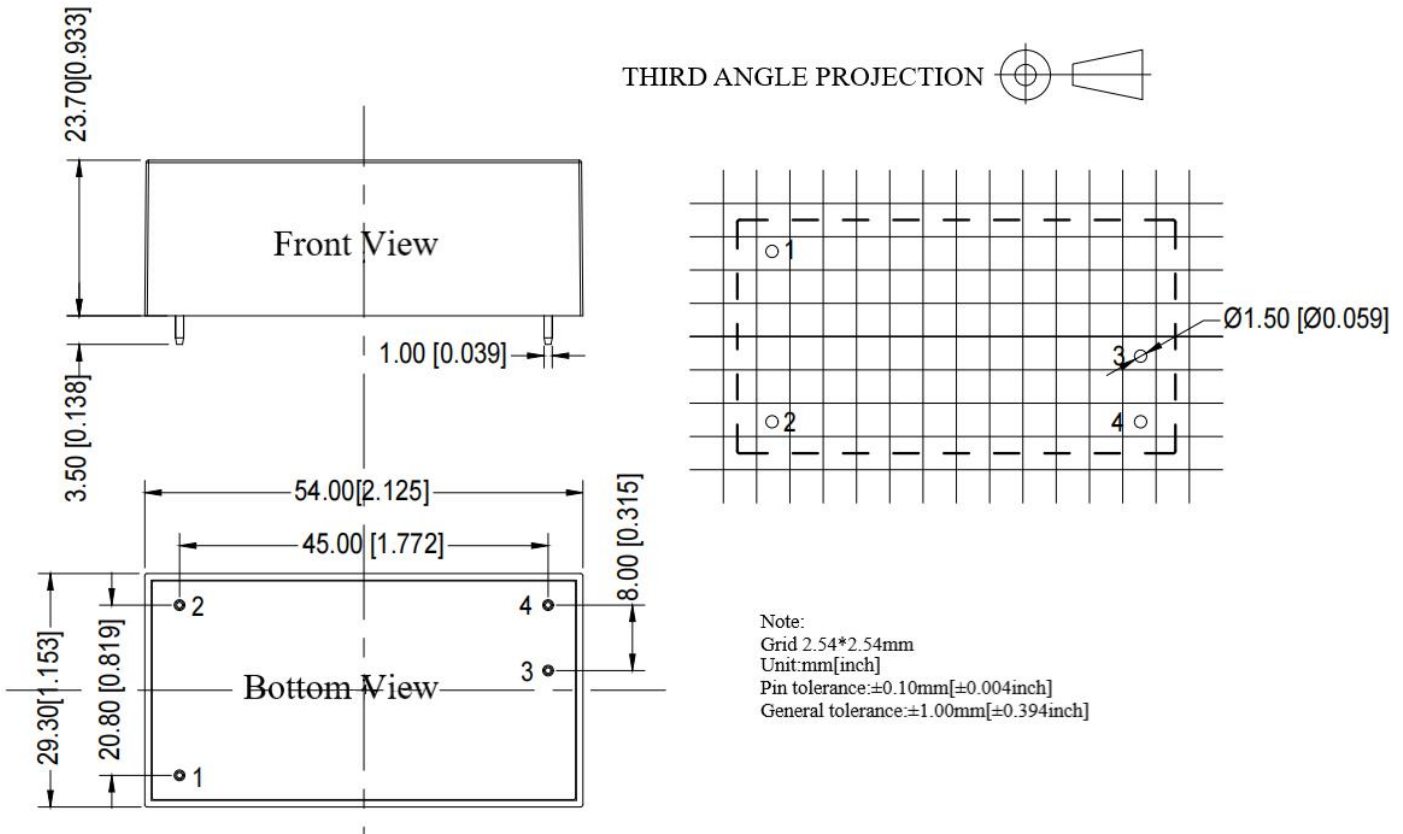
Physical Specifications

Case Material	Black flame-retardant and heat-resistant plastic (UL94V-0)	
Dimension	Horizontal package	54.0X 29.3X23.7mm
Weight		50g(TYP)
Cooling Method	Free air convection	

EMC Characteristics

Total Items	Sub Items	Test Standard	Class	
EMC	EMI	CE	CISPR22/EN55032 CLASS B	
		RE	CISPR22/EN55032 CLASS B	
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (see recommended circuit Photo 1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (see recommended circuit Photo 1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±1KV Perf.Criteria B (bare board)
				±2KV Perf.Criteria B (see recommended circuit Photo 1)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (see recommended circuit Photo 1)
Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B		

Packing Dimension



Packing Code	L x W x H	
G2	54.0X 29.3X23.7mm	2.126X1.153X0.933inch

Pin Definition

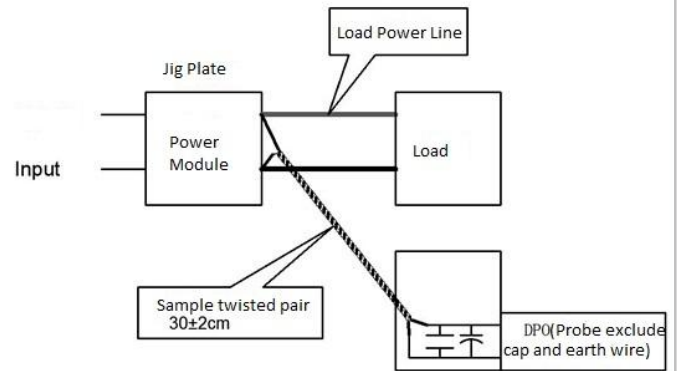
Pin-out	1	2	3	4
Single (S)	AC(L)	AC(N)	+Vo	-Vo

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

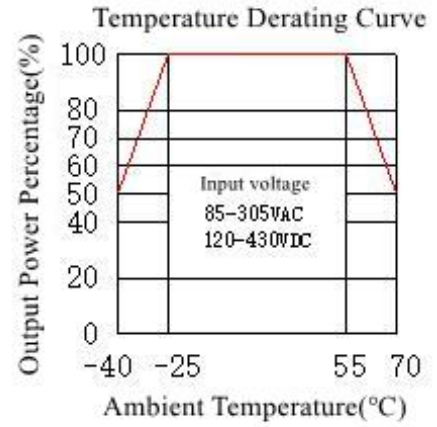
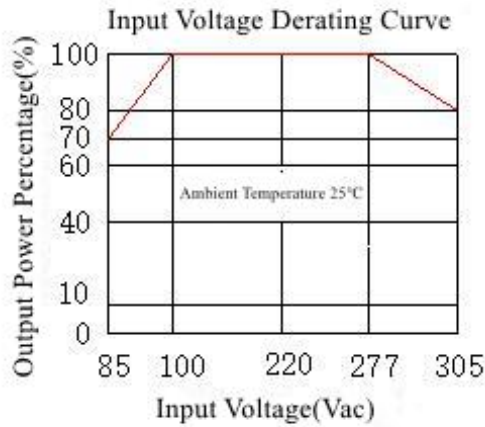
Test Method:

(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve



Note 1: Input Voltage should be derated base on Input Voltage Derating Curve when it is 85~100VAC/240~305VAC/120~140VDC/340~430VDC.

Note 2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Recommend Design Application

1. Typical Application Circuit

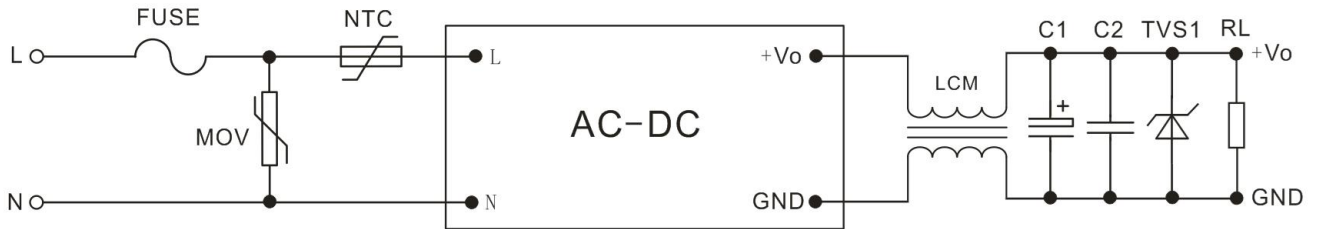


Photo 1

FUSE	Recommend 2A,250VAC (necessary)	C2	0.1uF/50V	TVS1	24V: SMBJ30.0A
MOV	14D511K	TVS1	5V: SMBJ7.0A	TVS1	48V: SMBJ64.0A
NTC	5D-9	TVS1	9V: SMBJ12.0A	LCM	Common mode inductor 180uH
C1	electrolytic capacitor 220uF	TVS1	12V: SMBJ20.0A	-	-

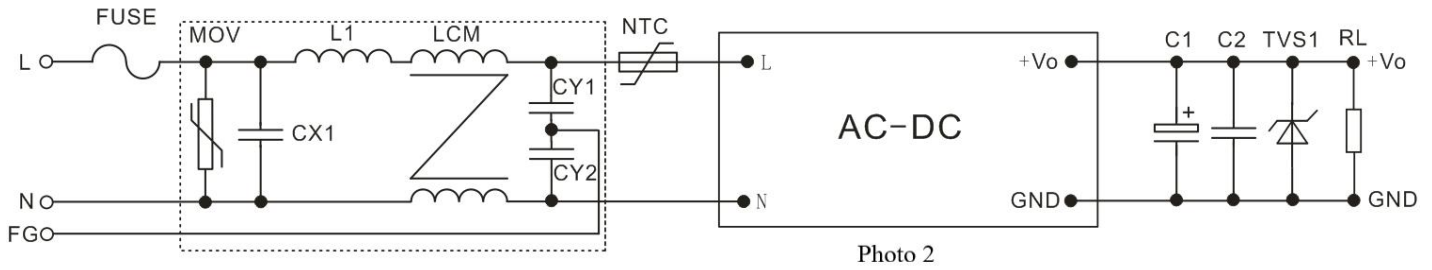
Note:

1. C1 is the output high-frequency low-impedance filter electrolytic capacitor, which can reduce the output ripple. It can be increased according to the customer's use conditions. The capacitance withstand voltage is more than 1.2 times the output voltage.

2. TVS1 is a transient voltage absorber, which protects the subsequent circuit when the output voltage of the module is abnormal.

Choose the appropriate original model according to above table.

2.EMC recommended circuit(for higher EMC request)



FUSE	Recommend 2A,250VAC (necessary)	CY1, CY2	1nF/400VAC
MOV	14D511K	L1	820uH
NTC	5D-9	LCM	15-25mH
CX1	0.1uF/275VAC	-	-

Note:

- 1.The product should be used under the specification range, otherwise it will cause permanent damage to it.
- 2.Product's input terminal should connect to fuse;
- 3.If the product operated below the minimum load request, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- 4.If the product worked beyond the load range, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- 5.Unless otherwise specified, data in this datasheet are tested under conditions of **Ta=25 °C**, **humidity<75%** when inputting nominal voltage and outputting rated load(pure resistance load);
- 6.All index testing methods in this datasheet are based on our Company's corporate standards.
- 7.The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, please directly contact our technician for specific information;
- 8.We can provide customized product service;
- 9.The product specification may be changed at any time without prior notice.