

Typical Features	
◆	Wide input voltage range: 85-265VAC/120-380VDC
◆	No load power consumption ≤ 0.45W
◆	Transfer Efficiency 86%(TYP.)
◆	Switching Frequency: 65KHz
◆	Protections: short circuit, over current
◆	Isolation voltage: 4000Vac
◆	Conform to IEC62368/UL62368/EN62368 test Standard
◆	PCB mounting



Application Field

DA60-220SXXG2N3 Series ----- a compact size, high efficient 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, For EMC and safety spec conform to EN55032, IEC/EN61000 standard. 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	Ripple & Noise 20MHz (Max)	Efficiency@ Full Load, 220Vac (Typical)
		Power	Voltage	Current			
		(W)	Vo1(V)	Io1(m A)			
-	DA60-220S12G2N3	60	12	5000	6000 u F	120 mVp-p	86 %
-	DA60-220S15G2N3	60	15	4000	4000 u F	120 mVp-p	87 %
-	DA60-220S48G2N3	60	48	1250	600 u F	150 mVp-p	88 %

- Note 1: The typical value of output efficiency is based on the product being aged at full load for half an hour;
- Note 2: The full load efficiency (% , TYP) in the table fluctuates by ±2%. The full load efficiency is the total output power divided by the input power of the module;
- Note 3: The ripple and noise test method uses the twisted pair test method. For specific test methods and matching, please see the following (Ripple & Noise Test Instructions);
- Note 4: Due to limited space, the above is only a partial product list. If you need products outside the list, please contact our sales department.

Input Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Input Voltage Range	AC input	85	220	265	VAC
	DC input	120	310	380	VDC
Input Frequency range	-	47	50	63	Hz
Input Current	115VAC	/	/	1.2	A

	220VAC	/	/	0.66	
Surge Current	115VAC	/	/	10	
	220VAC	/	/	20	
Leakage Current	-	0.5mA TYP/ 230VAC/ 50Hz			
Recommended External Input Fuse	-	3.15A/ 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	Vo	-	±2.0	±3.0	%
Line Regulation	Nominal load	Vo	-	-	±0.5	%
Load Regulation	Nominal input voltage, 20%~100% load	Vo	-	-	±1.0	%
No Load Power Consumption	Input 115VAC		-	-	0.45	W
	Input 220VAC		-	-		
Minimum Load	Single Output		0	-	-	%
Start up Delay Time	Nominal input voltage (full load)		-	1500	-	mS
Power-off Holding Time	Input 115VAC (full load)		-	200	-	mS
	Input 220VAC (full load)		-	100	-	
Dynamic Response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-5.0	-	+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	Full input voltage range		≥130% Io, self-recovery			Hiccup

General Specifications

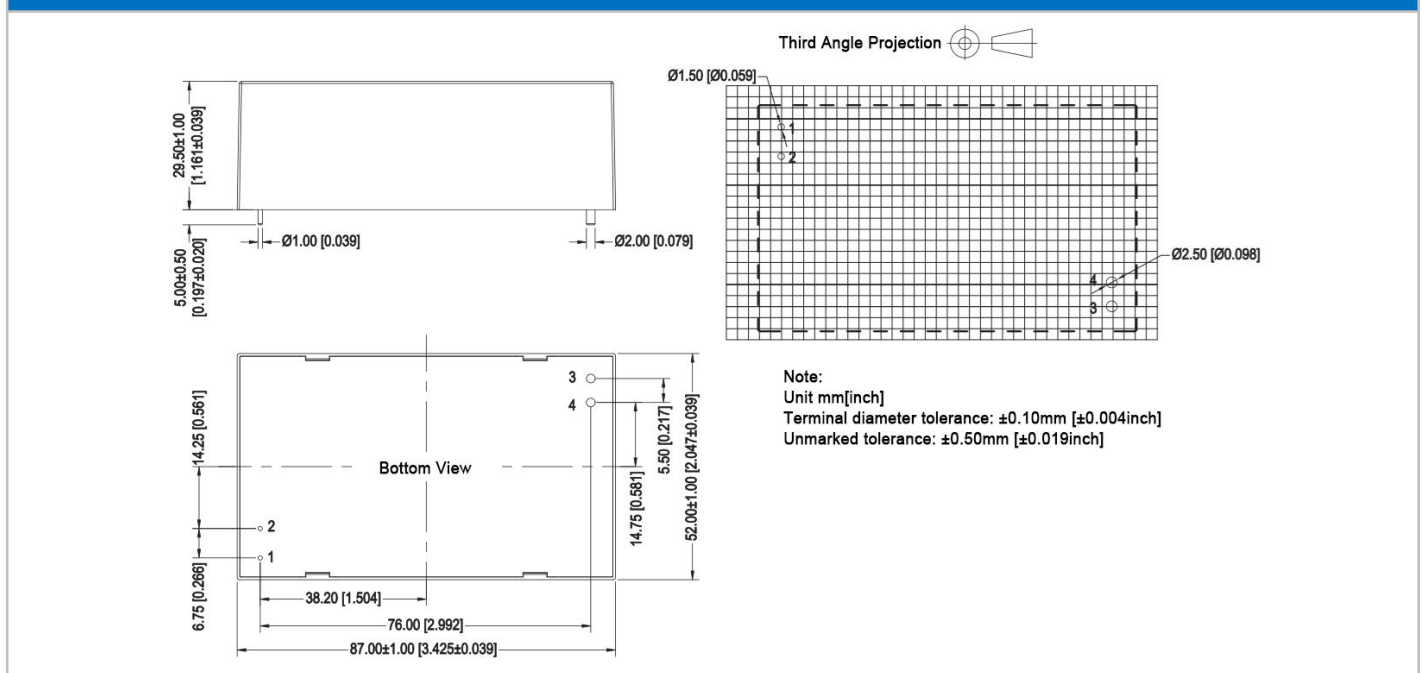
Item	Operating Condition		Min	Typ.	Max	Unit
Switching Frequency	-		-	65	-	KHz
Operating Temperature	-		-40	-	+75	°C
Storage Temperature	-		-40	-	+85	
Soldering Temperature	Wave soldering		260±4°C, time 5-10S			
	Manual soldering		360±8°C, time 4-7S			

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		-	EN62368/IEC62368			
Vibration		-	10-55Hz, 10G, 30Min, along X, Y, Z			
Safety Class		-	CLASS II			
Case Class		-	-			
MTBF		-	MIL-HDBK-217F@25°C > 300,000H			
Cooling Method		-	Free air convection			

EMC Characteristics

Total Item	Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032 CLASS B (Recommended Circuit 2)
		RE	CISPR22/EN55032 CLASS B (Recommended Circuit 2)
	EMS	RS	IEC/EN61000-4-3 10V/m Perf.Criteria B (Recommended Circuit 1)
		CS	IEC/EN61000-4-6 3Vr.m.s Perf.Criteria B (Recommended Circuit 1)
		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

Dimension



Packing Code	L x W x H	
-	87.0X52.0X29.5mm	3.425X2.047X1.161inch

Pin Specification

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

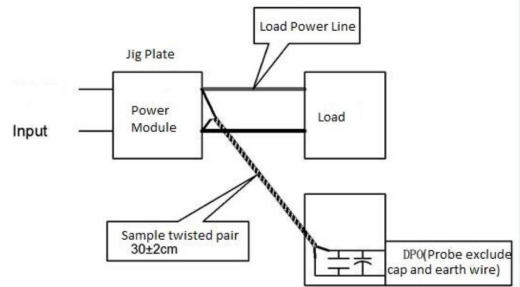
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

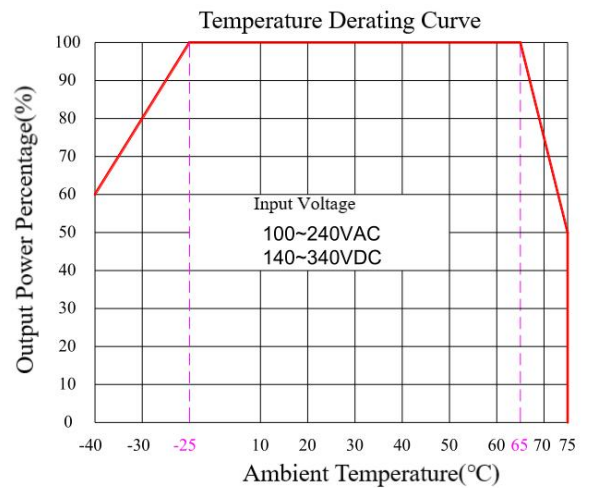
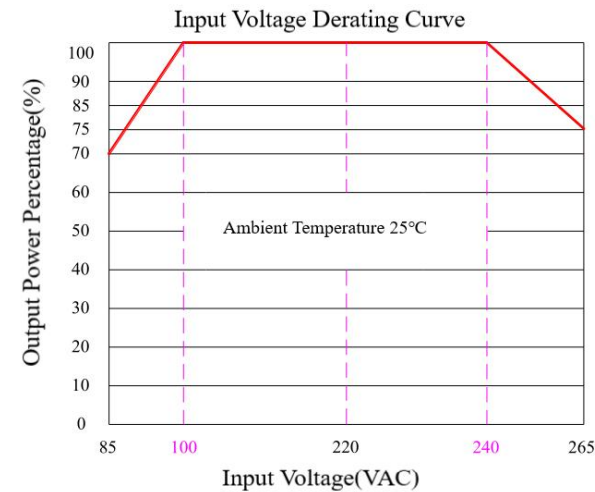
Test Method:

(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.



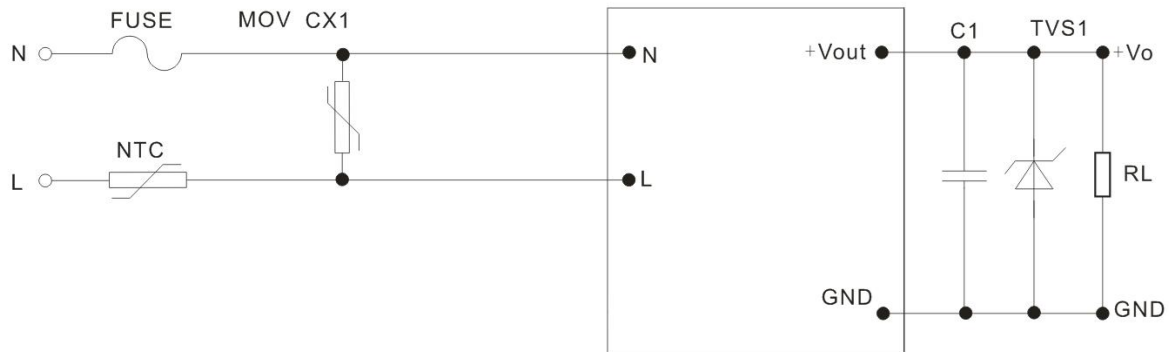
Product Characteristic Curve



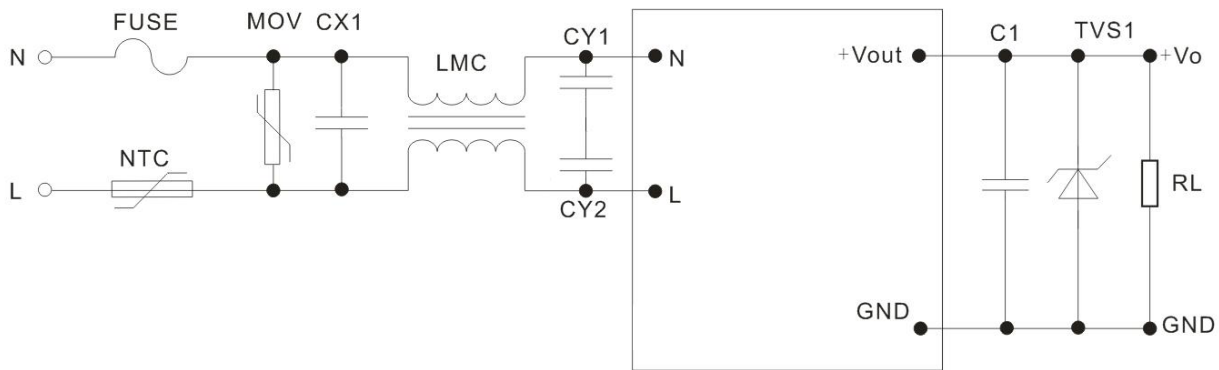
Note 1: Input Voltage should be derated based on Input voltage derating curve when it is 85~100VAC/240~265VAC/120~140VDC/340~380VDC.

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

Typical Application Circuit and EMC Recommended Circuit



Recommended Circuit 1



Recommended Circuit 2

Note 1:

1. Output filter capacitor C1 removes high-frequency noise. It is recommended to use a 1 μ F ceramic capacitor with a voltage drop greater than 80%;
2. TVS tube is recommended to protect the subsequent circuit (when the module is abnormal). 600W model is recommended; 5V output recommended: SMBJ7.0A, 9V output recommended: SMBJ12.0A, 12V output recommended: SMBJ20A, 15V output recommended: SMBJ20.0A, 24V output recommended: SMBJ30.0A, 48V output recommended: SMBJ64A;
3. MOV is a varistor, recommended model: 10D561K, which is used to protect the module from damage during lightning surges.
4. The general application requirements of customers use the recommended circuit in Recommended Circuit 1. If there are higher EMC requirements, please use the recommended circuit in Recommended Circuit 2. The specific recommended values in Recommended Circuit 2 are as follows:
 - 1) MOV varistor: recommended model: 10D-561K, which is used to protect the module from damage during lightning surge.
 - 2) NTC thermistor: 10D-9;
 - 3) Safety capacitors CY1, CY2: 1000pF/400VAC;
 - 4) Safety capacitor CX: 0.1 μ F/275VAC;
 - 5) Common mode inductor LCM: 15mH-30mH;
 - 6) FUSE (fuse): must be connected, recommended specification is 3.15A/250V, slow break.

Note 2:

1. The product should be used within the specification range, or it will cause permanent damage to it;
2. The input terminal should connect to fuse;
3. If the product is worked under the minimum requested load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
4. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
5. Unless otherwise specified, parameters in this datasheet were measured under the conditions of **Ta=25°C**, **humidity<75%** with nominal input voltage and rated output 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 product customization service,
9. Specifications are subject to change without prior notice, please follow up with our website for newest manual.

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