Typical Features

- Wide input voltage range 85-265VAC/120-380VDC
- No load power consumption ≤ 0.45W@220VAC
- Efficiency 86%(TYP.)
- Operating temperature from -40℃ to 85℃
- Switching Frequency 65KHz
- Short circuit protection & Over current protection
- Isolation voltage 4000VAC
- Altitude during operation 4000m Max
- Compliant with IEC/EN62368/UL62368
- With CE certificate
- PCB DIP mounting

Application Field

DA60-220SXXG2N3 Series ----- *Compact size & high efficiency modular 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. The additional circuit diagram 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	Ripple& Noise 20MHz (Max)	Efficiency@ Full Load, 220Vac
		Power	Voltage	Current			
		（W）	Vo（V）	Io（mA）	uF	mVp-p	% (Typ.)
CE	DA60-220S12G2N3	60	12	5000	6000	120	85
	DA60-220S15G2N3	60	15	4000	4000	150	85
	DA60-220S24G2N3	60	24	2500	2000	150	86
	DA60-220S48G2N3	60	48	1250	600	150	87

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: The ripple and noise are tested by the twisted pair method (Refer to the following Test Instructions in this datasheet).

Note 4: Please contact with Aipu sales for other output voltages requirement in this series but no in this table.

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	A
	220VAC	-	-	20	
No-load Power Consumption	Input 115VAC	-	-	0.45	W
	Input 220VAC	-	-		
Leakage Current	-	0.5mA TYP/ 230VAC/ 50Hz			
Recommended External Fuse	-	3.15A/250VAC Time-delay fuse			
Hot Plug	-	Unavailable			
Remote Control	-	Unavailable			

Output Specifications

Item		Operating Condition	Min	Typ.	Max	Unit
Voltage Accuracy		Full input voltage range, any load	-	±2.0	±3.0	%
Line Regulation		Rated load	-	-	±0.5	%
Load Regulation		Nominal input voltage, 20%~100% load	-	-	±1.0	%
Minimum Load		Single Output	0	-	-	%
Turn on Delay Time		Input 115VAC (full load)	-	1500	-	mS
		Input 220VAC (full load)	-		-	
Power-off Holde Up Time		Input 115VAC (full load)	-	200	-	mS
		Input 220VAC (full load)	-	100	-	
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
Temperature Drift Coefficient		-	-	±0.03%	-	%/℃
Over Current Protection		Full input voltage range	≥130% Io, self-recovery			Hiccup
Ripple & Noise		Full input voltage range	-	50	150	mV

General Specifications

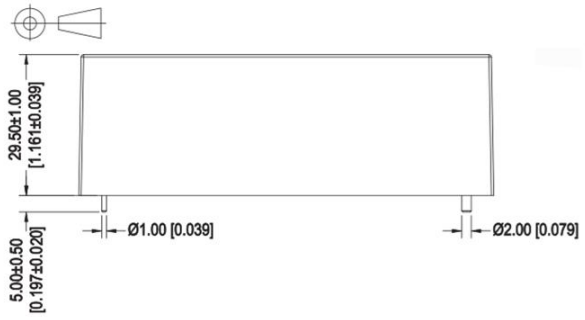
Item		Operating Condition	Min	Typ.	Max	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		Refer to the Temperature Derating Graph	-40	-	+85	℃
Storage Temperature		-	-40	-	+105	
Soldering Temperature		Wave soldering	260±4℃, time 5-10S			
		Manual soldering	360±8℃, time 4-7S			
Relative Humidity		-	10	-	90	%RH
Isolation Voltage	I/P-O/P	Test 1min, leakage current ≤5mA	4000	-	-	VAC

Insulation Resistance	I/P-O/P	@ DC500V	100	-	-	MΩ
Safety Standard		-	EN62368/ IEC62368			
Vibration		-	10-55Hz,10G,30 Min, along X,Y,Z			
Safety Class		-	CLASS Ⅱ			
Case Flame Class		-	UL94V-0			
MTBF		-	MIL-HDBK-217F@25℃＞300,000H			
Unit Weight		215g（TYP）				

EMC Performance

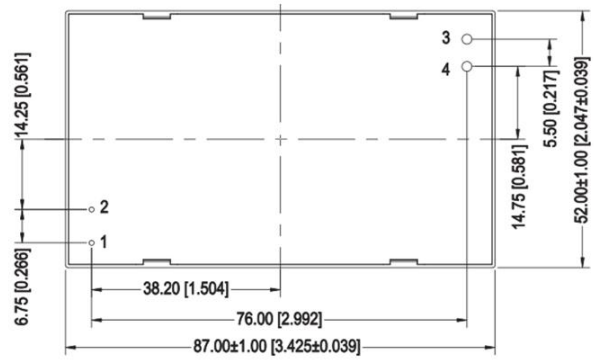
Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 2)
		RE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (with the Recommended Circuit 1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (with the Recommended Circuit 1)
		ESD	IEC/EN61000-4-2	Contact ±6KV/ Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±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

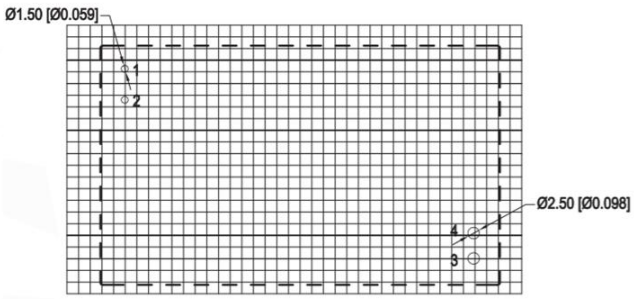
Mechanical Dimensions



Unit: mm[inch]
Pin diameter tolerance ±0.10[±0.004]
General tolerance ±0.50[±0.020]

Pin No.	Function
1	AC(L)
2	AC(N)
3	+Vo
4	-Vo





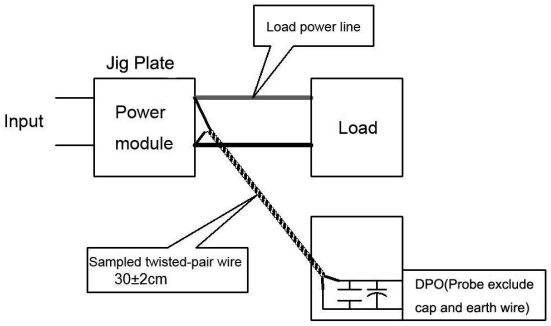
PCB layout vertical view
Grid 2.54x2.54[0.10x0.10]

Package Code	Dimensions L x W x H	
-	87.00X52.00X29.50 mm	3.425X2.047X1.161 inch

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

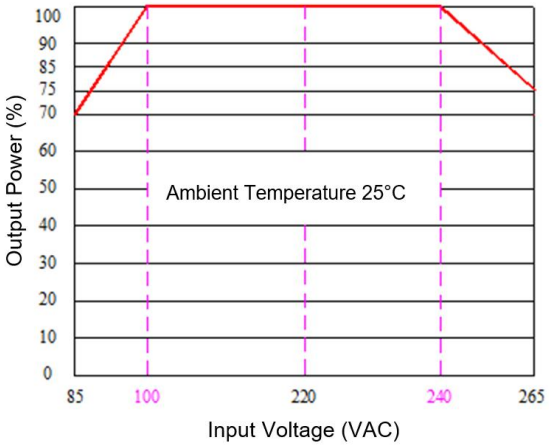
1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the 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.

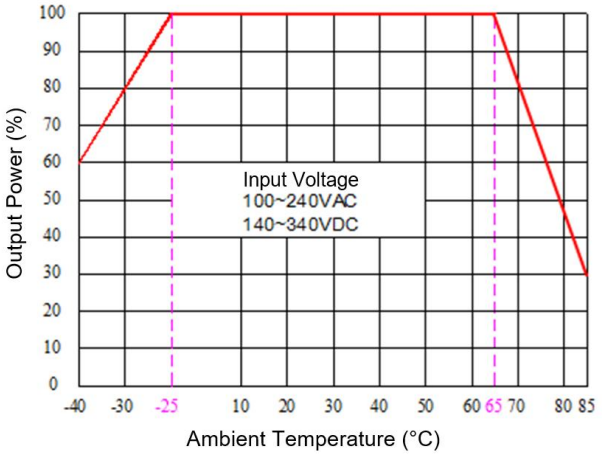


Product Performance Graphs

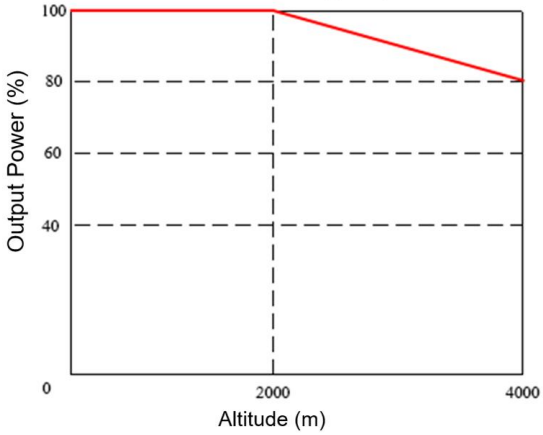
Input Voltage Derating Graph



Temperature Derating Graph



Altitude Derating Graph



Note 1 - The output power should be derated based on the input voltage derating graph at 85~100VAC/240~265VAC &120~140VDC/ 340~380VDC.

Note 2 - This product should operate at a natural air condition, please contact us if it need be used at a closed space.

Recommended Circuit Diagrams for EMC

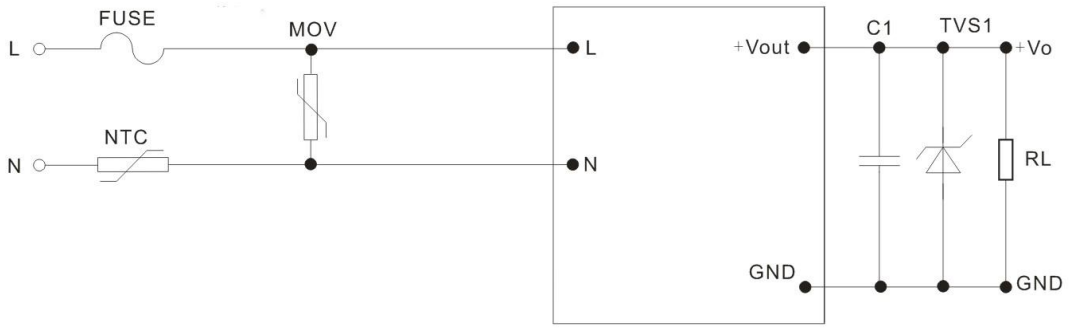


Figure - Circuit 1

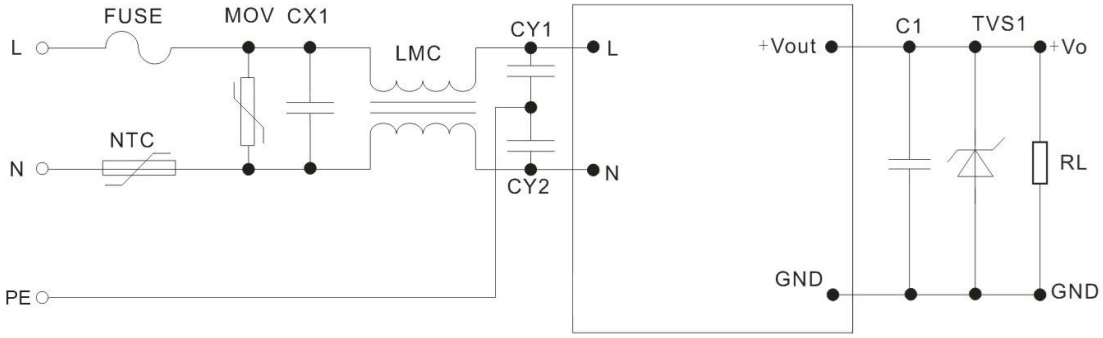


Figure - Circuit 2

Note:

1. 1μF ceramic SMD capacitor is recommended for the output filter capacitor C1 to suppress the high-frequency noise. The capacitor's withstand voltage should be derated to at least 80%.
2. TVS1 is recommended to protect the output circuit while the power supply is operating at abnormal condition. 600W TVS is recommended, SMBJ7.0A for 5V output, SMBJ12.0A for 9V output, SMBJ20A for 12V&15V output, SMBJ30.0A for 24V output and SMBJ64A for 48V output.
3. 10D561K/3500A is recommended for MOV which is used to protect the power supply against the lightning surges.
4. The circuit diagram #1 is recommended for the typical application, Circuit #2 is recommended for higher EMC requirements, following the components parameters.

- MOV - 10D-561K/ 3500A
- NTC - 10D-9
- CY1, CY2 - Y1/102M/400VAC
- CX1 - X2/104K/275VAC
- Common mode choke LMC - 15mH-30mH/1.5A
- FUSE - 3.15A/250V time-delay fuse (Necessary)

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 at over-load condition.

5. Unless otherwise specified, all values or indicators in this datasheet are tested at Ta=25℃, 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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