

Typical Features

- ◆ Wide input voltage range 85-305VAC/100-430VDC
- ◆ No load power consumption $\leq 0.15\text{W}@220\text{Vac}$
- ◆ Operating temperature from -40°C to $+85^{\circ}\text{C}$
- ◆ Efficiency 86%(TYP.)
- ◆ Switching Frequency 65KHz
- ◆ Short circuit, over current & over voltage protections
- ◆ Isolation voltage 4000VAC
- ◆ Altitude during operation 4000m Max
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ Conform to CE & RoHS, with CB & UL certificates
- ◆ Enclosed plastic case, flame class UL94 V0



Application Field

DA20-220SXXG2N4 Series ---- Compact size & high-efficiency AC-DC 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, industry, instrument and smart home devices, etc. The additional circuit for EMC is recommended in this data sheet for the application with higher EMC requirement.

Typical Product List

Certificate	Part No.	Output Specifications			Max. Capacitive Load uF	Ripple & Noise @20MHz (Max) mVp-p	Efficiency @Full load 220VAC % (Typ.)
		Power	Voltage	Current			
		(W)	Vo (V)	Io (m A)			
-	DA20-220S3V3G2N4	13.2	+3.3	4000	8000	80	83%
CB/CE/UL	DA20-220S05G2N4	20	+5	4000	8000	80	84%
-	DA20-220S5V2G2N4	20	+5.2	3846	8000	80	84%
CB/CE/UL	DA20-220S09G2N4	20	+9	2222	5000	80	85%
CB/CE/UL	DA20-220S12G2N4	20	+12	1666	5000	80	86%
CB/CE/UL	DA20-220S12V5G2N4	20	+12.5	1600	4000	80	86%
CB/CE/UL	DA20-220S15G2N4	20	+15	1333	4700	80	86%
CB/CE/UL	DA20-220S24G2N4	20	+24	833	2000	100	88%

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 $\pm 2\%$ 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 3 - Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

Note 4 - In the part numbers, suffix -T indicates a kind of chassis packaging, -TS indicates a kind of packaging of DIN Rail which width is 35mm.

Input Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Input Voltage Range	AC Input	85	220	305	VAC
	DC Input	100	310	430	VDC
Input Frequency range	-	47	50	63	Hz
Input Current	100VAC	-	-	0.55	A
	220VAC	-	-	0.35	
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 Fuse	-	2A-5A/300VAC time-delay fuse			
Hot Plug	-	NA			
Remote Control	-	NA			

Output Specifications

Item		Operating Condition		Min	Typ.	Max	Unit
Voltage Accuracy		Full input voltage range, any load	Vo=3.3V	-	±2.0	±6.0	%
			Others	-	±1.0	±2.0	
Line Regulation		Rated load		-	-	±0.5	%
Load Regulation		Nominal input voltage, 20%~100% load	Vo=3.3V	-	-	±4.0	%
			Others	-	-	±2.0	
Minimum Load		Single Output		0	-	-	%
Turn-on Delay Time		Input 115VAC (full load)		-	500	-	mS
		Input 220VAC (full load)		-		-	
Power-off Hold up 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 3.3V/5V/5.2VDC		≤10			VDC
		Input 9VDC		≤15			

	Input 12VDC/12.5VDC	≤18			
	Input 15VDC	≤20			
	Input 24VDC	≤30			
Ripple & Noise	-	-	80	100	mV

Note - The ripple and noise are tested by the twisted pair method, please refer to the following Test Instruction.

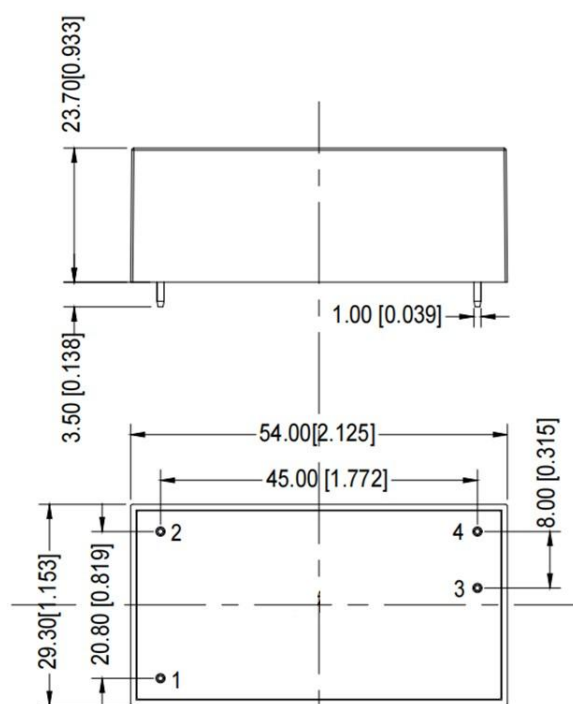
General Specifications

Item		Operating Condition	Min	Typ.	Max	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		Refer to the temperature derating graph	-40	-	+85	°C
Storage Temperature		-	-40	-	+105	
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		@ DC500V	100	-	-	MΩ
Safety Standard		-	IEC/EN62368, UL62368			
Vibration		-	10-55Hz, 10G, 30Min, along X,Y,Z			
Safety Class		-	CLASS II			
Case flame class		-	UL 94V-0			
MTBF		MIL-HDBK-217F @25°C	>1,500,000H			
Unit Weight		Part No.	Weight (Typ.)			
		DA20-220SXXG2N4	55g			
		DA20-220SXXG2N4-T	75g			
		DA20-220SXXG2N4-TS	95g			

EMC Performance

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

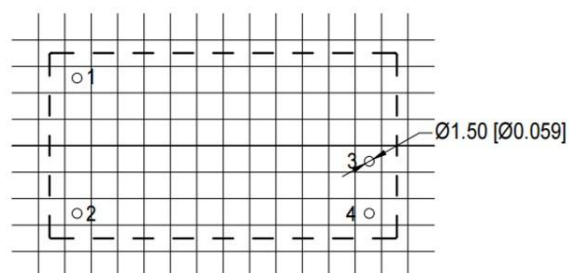
Mechanical Dimensions



Unit: mm[inch]

Pin diameter tolerance $\pm 0.10[\pm 0.004]$

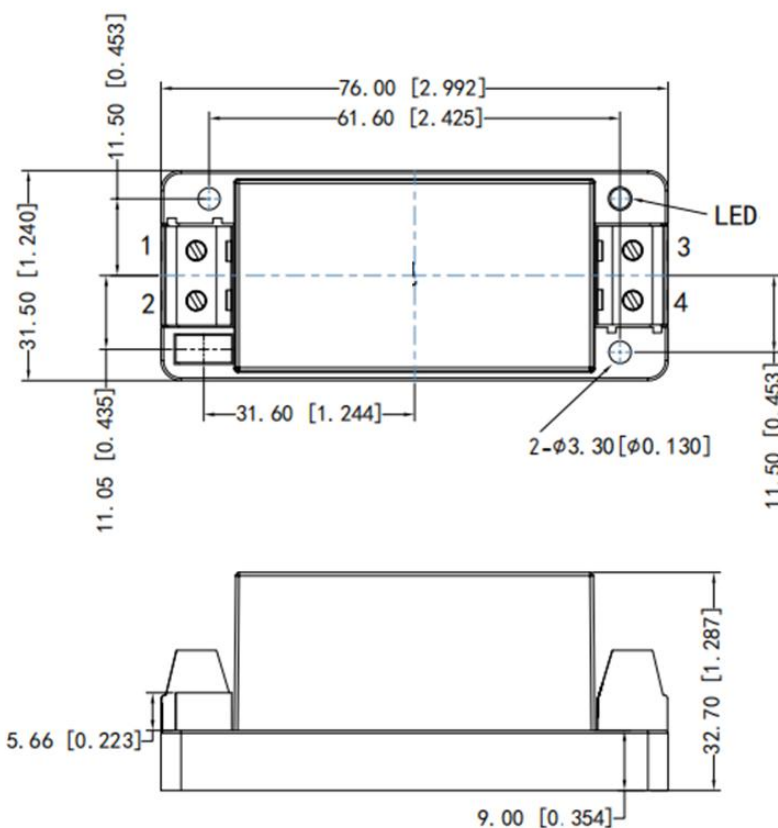
General tolerance $\pm 1.00[\pm 0.039]$



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

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

-T Package Dimensions



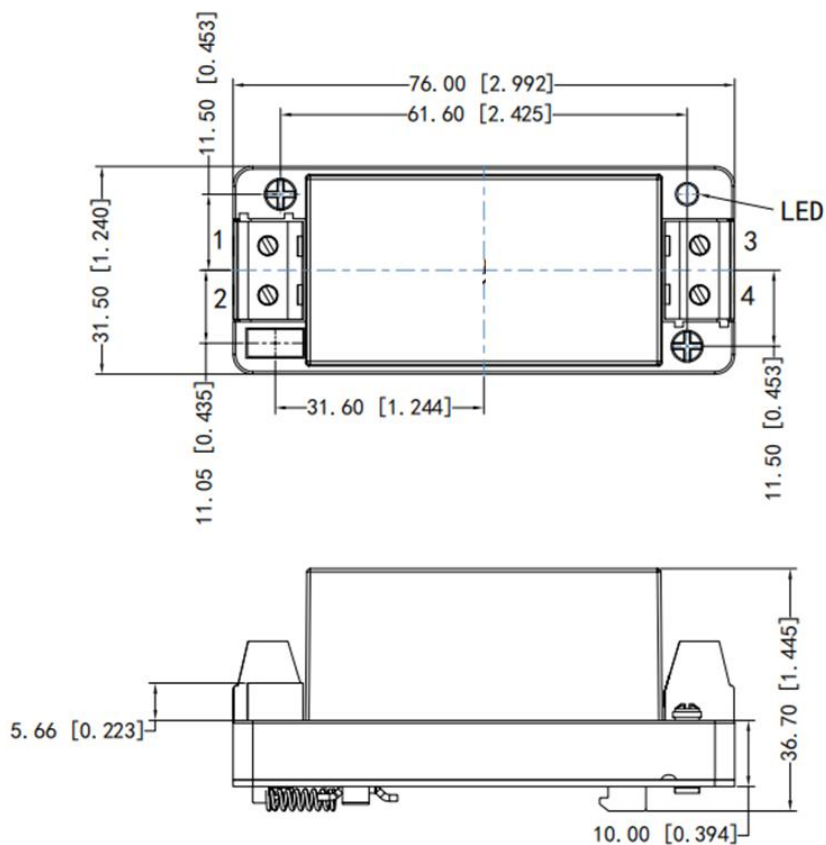
Terminal No.	Function
1	AC(L)
2	AC(N)
3	+Vo
4	-Vo

Unit: mm[inch]

Lead wire size 24-12AWG

Screwing torque 0.4 N.m Max

General tolerance $\pm 1.00[\pm 0.039]$

-TS Package Dimensions

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

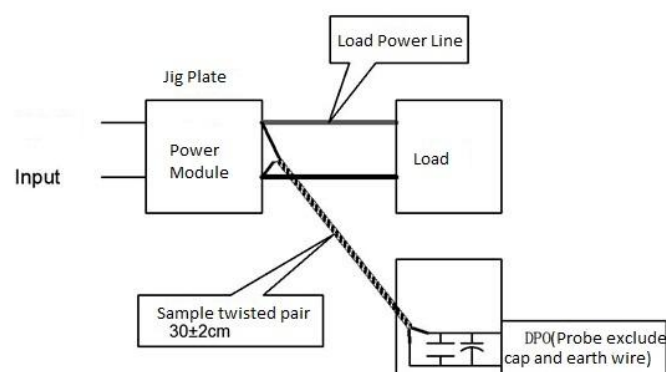
Unit: mm[inch]
Lead wire size 24-12AWG
Screwing torque 0.4 N.m Max
General tolerance $\pm 1.00[\pm 0.039]$

Part No.	Dimensions L x W x H	
DA20-220SXXG2N4	54.0 X 29.3 X 23.7 mm	2.125 X 1.153 X 0.933 inch
DA20-220SXXG2N4-T	76.0 X 31.5 X 32.7 mm	2.992 X 1.240 X 1.287 inch
DA20-220SXXG2N4-TS	76.0 X 31.5 X 36.7 mm	2.992 X 1.240 X 1.445 inch

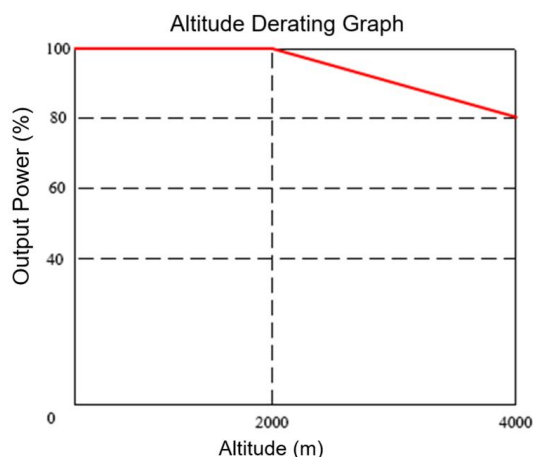
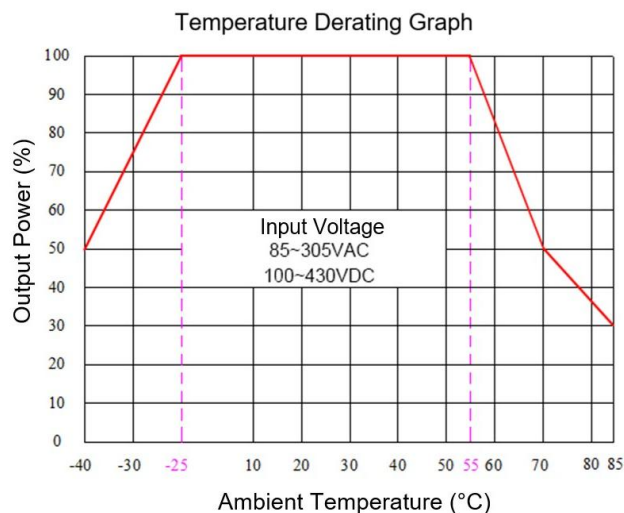
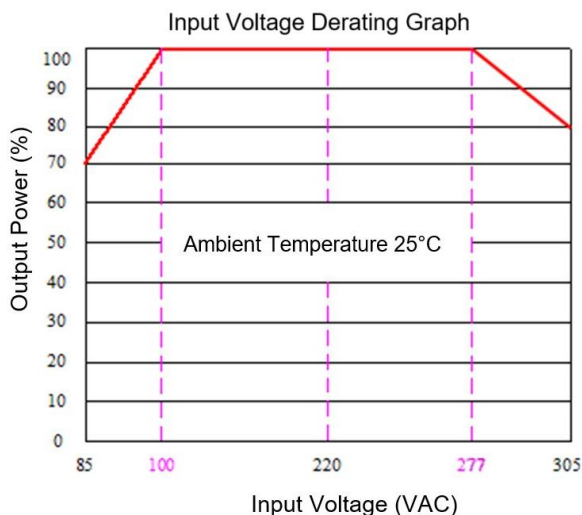
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHZ bandwidth)

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 $30\text{cm} \pm 2\text{cm}$) 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 Characteristics Graphs



Note 1 - The output power should be derated based on the input voltage derating graph at 85~100VAC/277~305VAC/100~140VDC/ 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.

Recommend Circuit Diagrams for Application

1. Typical Application Circuit

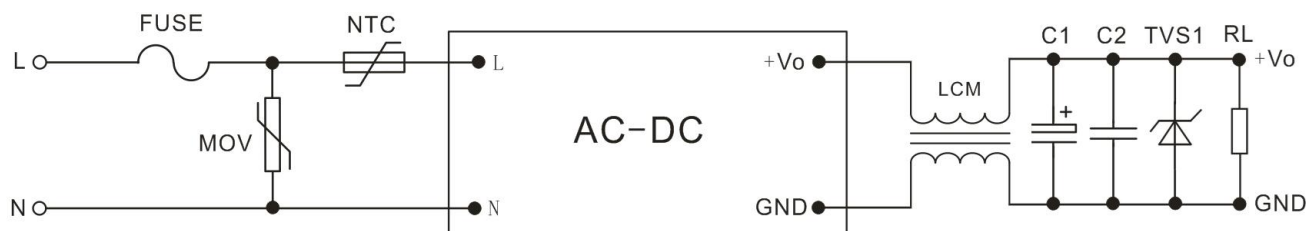


Figure 1

FUSE	2A/300VAC Time-delay fuse (necessary)	C2	0.1uF/50V/1206	TVS1	SMBJ20.0A (15V output)
MOV	14D561K/4500A	TVS1	SMBJ7.0A (3.3V, 5V & 5.2V outputs)	TVS1	SMBJ30.0A (24V output)
NTC	5D-9(5Ω,3A,9D)	TVS1	SMBJ12.0A (9V output)	TVS1	SMBJ64.0A (48V output)
C1	220uF Electrolytic capacitor	TVS1	SMBJ20.0A (12V & 12.5V outputs)	LCM	CMC 180uH/5A

Note:

1. A high-frequency low-resistance electrolytic capacitor is recommended for C1 which can decrease the output ripple. It's withstand voltage should be more than 1.2X of the output voltage.
2. TVS1 is a transient voltage absorber, it is recommended to protect the output circuit when the converter output voltage is not normal.

2. Recommended circuit diagram for High EMC requirement

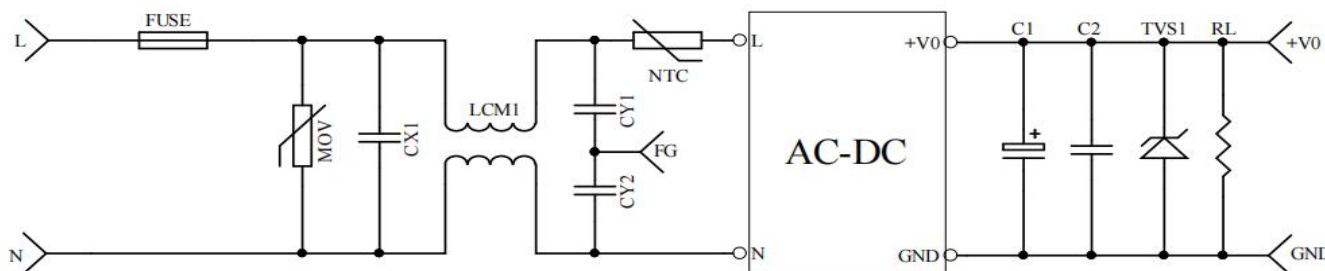


Figure 2

FUSE	2A/300VAC Time-delay fuse (necessary)	CY1, CY2	Y1/102M/400VAC
MOV	14D561K/4500A	LCM1	15-25mH/0.7A
NTC	5D-9	-	-
CX1	X2/224K/310VAC	-	-

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°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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