AC/DC Converter

FA5-220SXXG2D4(-T)(-TS) Series

Typical Features

- ◆ Wide input voltage range 85-305VAC/120-430VDC
- ◆ No load power consumption ≤0.25W @220VAC
- ◆ Efficiency up to 76%(TYP.)
- ◆ Operating temperature from -40 to +85℃
- ◆ Switching Frequency 65KHz
- ◆ Short circuit & over-current protections
- ◆ Isolation voltage 4000VAC
- ◆ Altitude during operation 5000m Max
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ With TUV-CE, CB & UL Certificates
- ◆ PCB DIP mounting

Application Field

FA5-220SXXG2D4(-T)(-TS) 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 & 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 diagram for EMC is recommended for the application with high EMC requirement.*

Typical Product List

Certificate	Part No.	Output Specifications			Max Capacitive Load	Max Ripple & Noise 20MHz	Efficiency@ Full Load, 220Vac
		Power	Voltage	Current			
		(W)	Vo (V)	Io (mA)	uF	mVp-p	%(Typ.)
CE	FA5-220S3V3G2D4	3.3	3.3	1000	2000	100	69
CE/CB/UL	FA5-220S05G2D4	5	5	1000	2000	100	72
CE/CB/UL	FA5-220S12G2D4	5	12	416	800	120	75
CE	FA5-220S12V3G2D4	5	12.3	406	800	120	76
CE/CB/UL	FA5-220S12V5G2D4	5	12.5	400	800	120	76
CE/CB/UL	FA5-220S15G2D4	5	15	333	800	120	76
CE/CB/UL	FA5-220S24G2D4	5	24	208	300	150	78

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 ±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 suffix -T is for the Chassis package, -TS is for the package 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	120	310	430	VDC
Input Frequency range	-	47	50	63	Hz
No Load Power Consumption	Input 115VAC	-	-	0.25	W
	Input 220VAC	-	-		
Input Current	Input 115VAC	-	-	0.12	A
	Input 220VAC	-	-	0.08	
Surge Current	Input 115VAC	-	-	15	
	Input 220VAC	-	-	20	
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
Recommended External Fuse	-	2A/300VAC 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		Nominal input voltage, full load	-	50	-	mS
Power-off Hold up Time		Input 115VAC, full load	-	50	-	mS
		Input 220VAC, full load	-	100	-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%	-5.0	-	+5.0	%
	Recovery time		-	5.0	-	mS
Output Overshoot		Full input voltage range	≤10%Vo			%
Short circuit Protection			Continuous, self-recovery			Hiccup
Temperature Drift		-	-	±0.03%	-	%/℃
Over Current Protection		Input 220VAC	≥130% Io, self-recovery			Hiccup
Ripple & Noise		Full input voltage range	-	60	150	mV
		Note: The Ripple & Noise is tested by the twisted pair method, please refer to the following test instruction.				

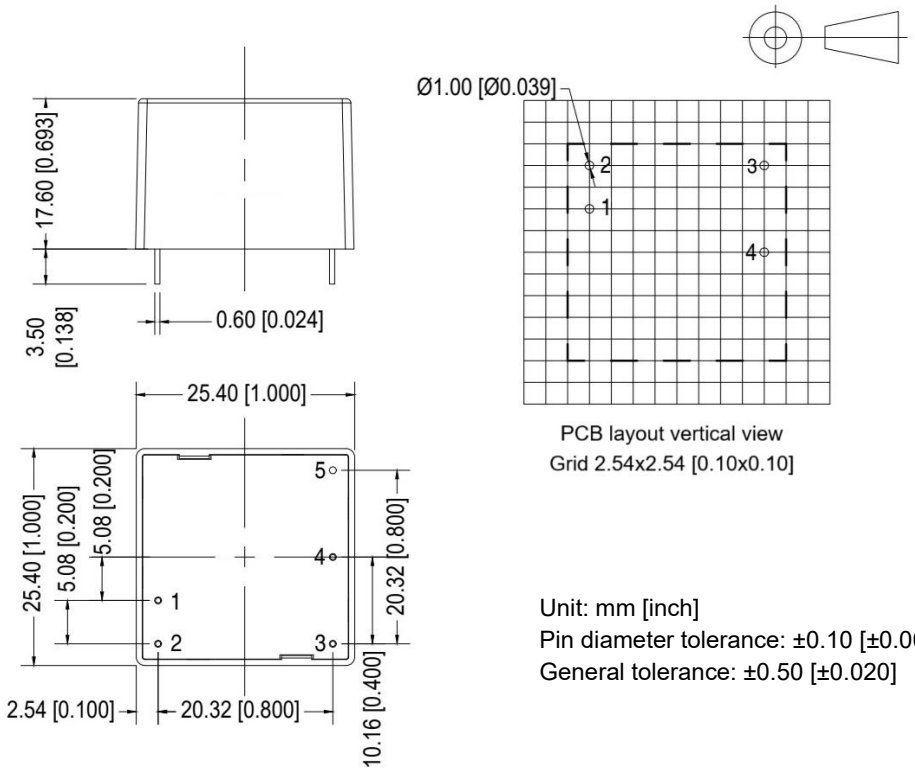
General Specifications

Item		Operating Condition	Min	Typ.	Max	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		Refer to the temperature derating graph	-40	-	+85	℃
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	Dielectric Test 1min, leakage current ≤5mA	4000	-	-	VAC
Insulation Resistance	I/P-O/P	@ DC500V	100	-	-	MΩ
Safety Standard		-	IEC/EN62368/UL62368			
Vibration		-	10-55Hz,10G, 30 Min, along X, Y, Z			
Safety Class		-	CLASS Ⅱ			
Flame Class of Case			UL94-V0			
MTBF		-	MIL-HDBK-217F@25℃ ＞2799KH			
Unit weight		Part No.	Weight (Typ.)			
		FA5-220SXXG2D4	18g			
		FA5-220SXXG2D4-T	38g			
		FA5-220SXXG2D4-TS	58g			

EMC Performance

Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 1)
		RE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 1)
	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	Line to line ±2KV / line to ground ±4KV Perf.Criteria B (with the Recommended Circuit 1)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B
		Voltage Dips & Interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

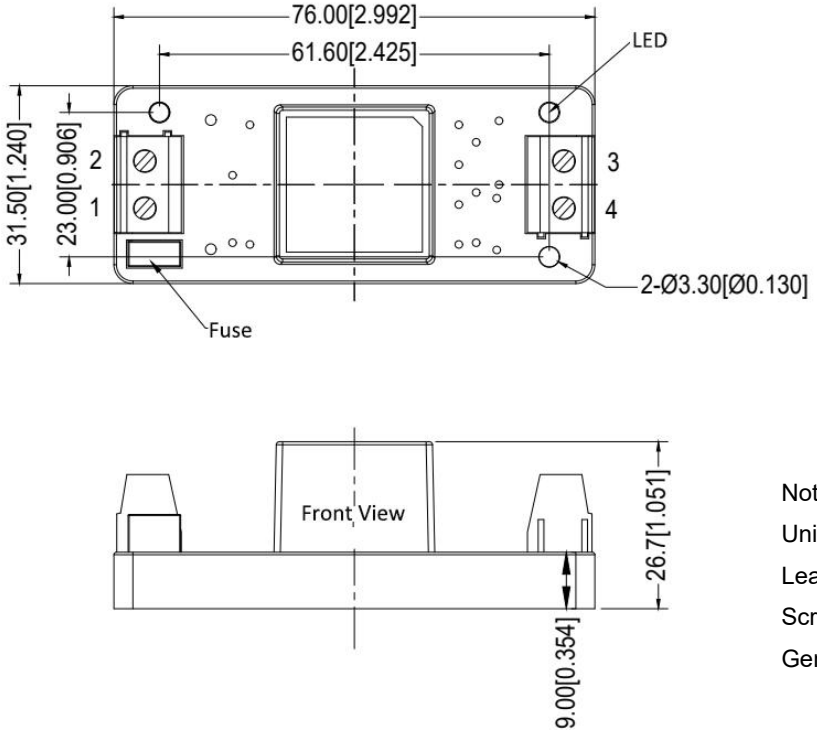
Mechanical Dimensions



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

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

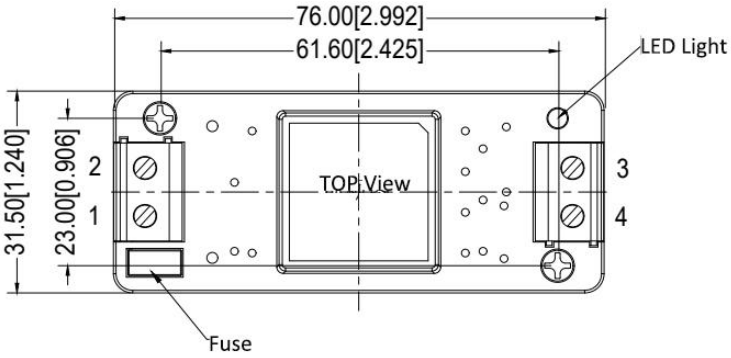
-T Package Mechanical Dimensions



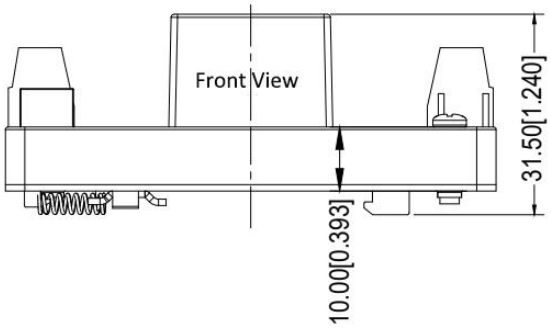
Terminal No.	Function
1	AC(L)
2	AC(N)
3	+Vout
4	-Vout

Note:
Unit: mm [inch]
Lead wires gauge: 24-12AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.00 [±0.039]

-TS Package Mechanical Dimensions



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



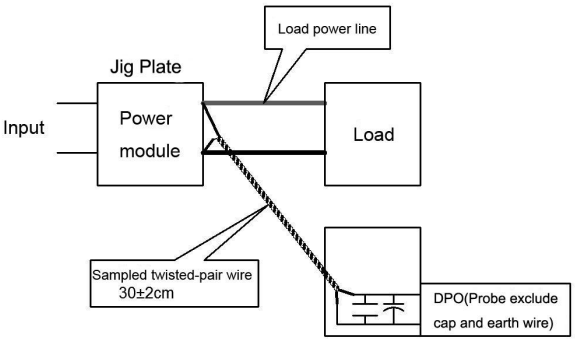
Note:
Unit: mm [inch]
Lead wires gauge: 24-12AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.00 [±0.039]

Package Code	Dimensions L x W x H	
-	25.40X25.40X17.60 mm	1.000X1.000X0.693 inch
-T	76.00X31.50X26.70 mm	2.992X1.240X1.051 inch
-TS	76.00X31.50X31.50 mm	2.992X1.240X1.240 inch

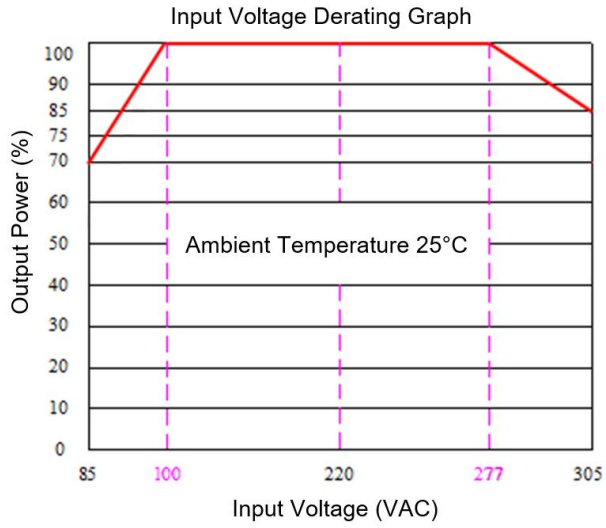
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz Bandwidth)

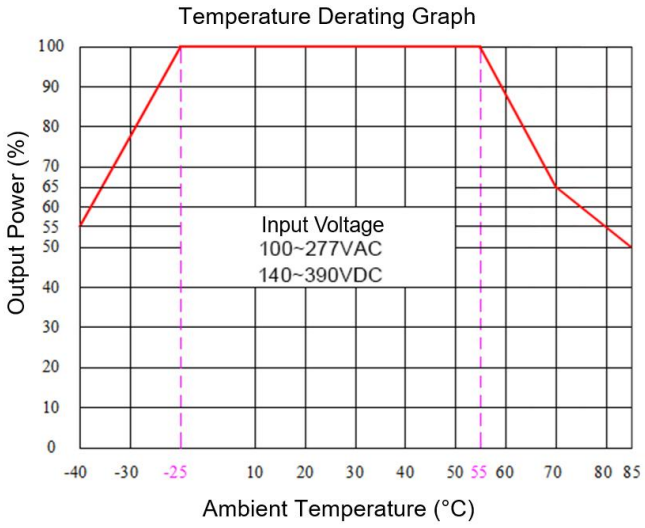
1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the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

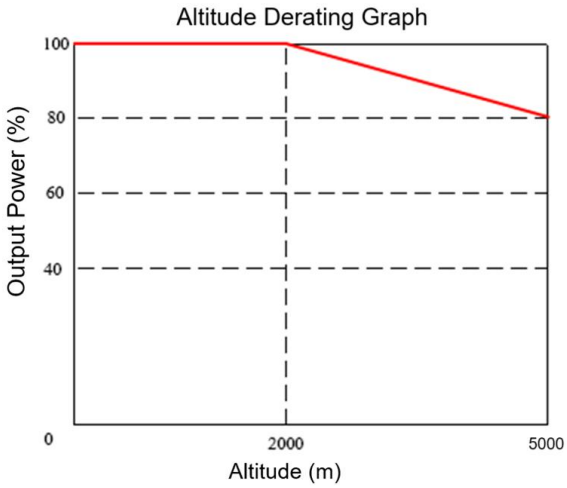
2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be start 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 & 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 Diagram for Application

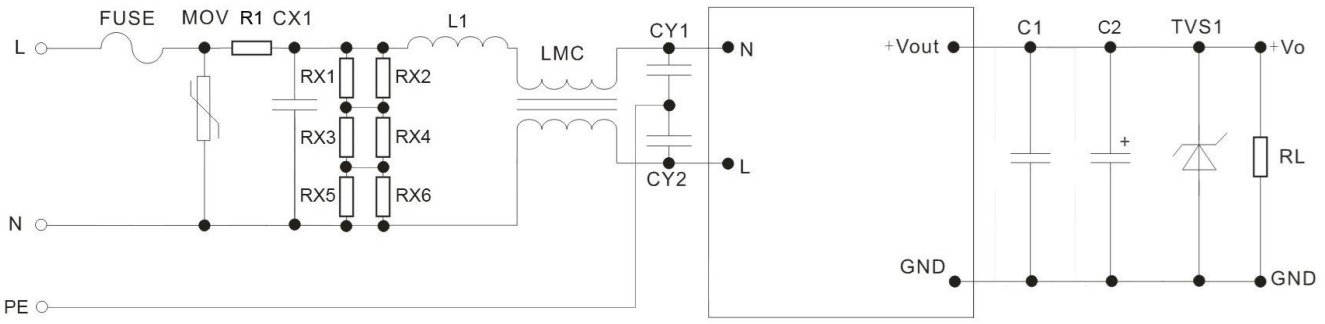


Figure – Circuit 1

Part No.	FUSE (*)	MOV	R1 (*)	CX1	RX1 RX2 RX3 RX4 RX5 RX6	L1	LMC	CY1 CY2	C1	C2	TVS1
FA5-220S3V3G2D4	2A/ 300V Time delay fuse	14D561K 4500A	33Ω/ 3W Wire-wound resistor	X2/ 334K/ 305VAC	1206/1.5M 1/4W	1.2mH/ 0.3A	20mH/ 0.3A	Y1/ 102M/ 400VAC	1uF/50V	100uF 16V	SMBJ7.0A
FA5-220S05G2D4											
FA5-220S12G2D4										68uF 16V	SMBJ20A
FA5-220S12V3G2D4											
FA5-220S12V5G2D4											
FA5-220S15G2D4											
FA5-220S24G2D4										47uF 35V	SMBJ30A

Note: The * marked components are necessary, not optional.

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 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.

Guangzhou Aipu Electron Technology Co., Ltd

Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China.

Tel: 86-20-84206763 Fax: 86-20-84206762 HOTLINE: 400-889-8821

E-mail: sales@aipu-elec.com Website: https://www.aipupower.com

