Typical Features

- Wide input voltage range 85-305VAC/120-430VDC
- No load power consumption ≤0.25W@220VAC
- Efficiency up to 78%(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

EN62368-1

UL62368-1

IEC62368-1

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. Additional circuit diagram for EMC is recommended for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Input Voltage		Output Specifications			Max Capacitive Load @220VAC	Ripple & Noise 20MHz (Max)	Efficiency @full load 220VAC (Typ.)
		Nominal	Range	Power	Voltage	Current			
		(VAC)	(VAC)	P (W)	Vo (VDC)	Io (mA)	uF	mVp-p	%
CE	FA5-220S3V3G2D4	220	85 - 305	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 requirements of 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.

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Input Specifications

Item	Test 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
Standby power consumption	Input 115VAC	-	0.15	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			
ON/OFF Control	-	Unavailable			

Output Specifications

Item		Test Condition	Min	Typ.	Max	Unit
Output 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	-	-	%
Temperature drift coefficient		-	-	±0.03	-	%/℃
Turn-on delay time		Input 115VAC, full load	-	-	500	mS
		Input 220VAC, full load	-	-		
Power-off hold up time		Input 115VAC, full load	-	50	-	mS
		Input 220VAC, full load	-	100	-	
Dynamic response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-	-	5.0	mS
Output overshoot		Full input voltage range	≤10			%Vo
Short circuit protection			Continuous, self-recovery			Hiccup
Over current protection		Input 220VAC	130%Io	-	230%Io	Hiccup
Ripple & Noise		Full input voltage range	-	60	150	mV
Note: The Ripple & Noise is tested by the Parallel-line method, please refer to the following test instruction.						

General Specifications

Item	Test Condition	Min	Typ.	Max	Unit
Switching frequency	-	-	65	-	KHz
Operating temperature	Refer to the temperature derating graph	-40	-	+85	℃
Storage temperature	-	-40	-	+105	

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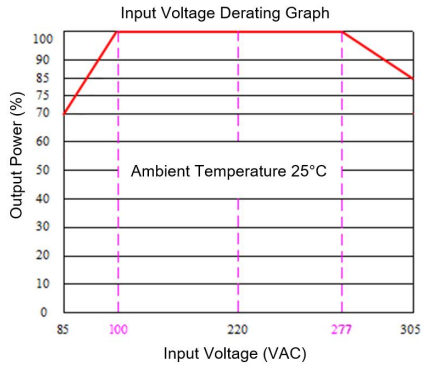
Soldering temperature	Wave soldering		260±4℃, time 5-10S			
	Manual soldering		360±8℃, time 4-7S			
Relative humidity	-		10	-	90	%RH
Isolation voltage	I/P-O/P	Test 1min, leakage current <5mA	4000	-	-	VAC
Insulation resistance	I/P-O/P	@ DC500V	100	-	-	MΩ
MTBF	MIL-HDBK-217F@25℃		2799	-	-	K hours
Safety standard	-		IEC/EN62368/UL62368			
Vibration	-		10-55Hz,10G, 30 Min, along X, Y, Z			
Safety class	-		CLASS Ⅱ			
Flame class if case			UL94-V0			

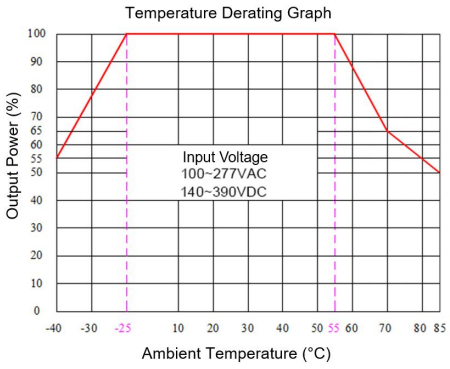
Weights & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H	
	FA5-220SXXG2D4	18g	25.40X25.40X17.60 mm	1.000X1.000X0.693 inch
	FA5-220SXXG2D4-T	38g	76.00X31.50X26.70 mm	2.992X1.240X1.051 inch
	FA5-220SXXG2D4-TS	58g	76.00X31.50X31.50 mm	2.992X1.240X1.240 inch

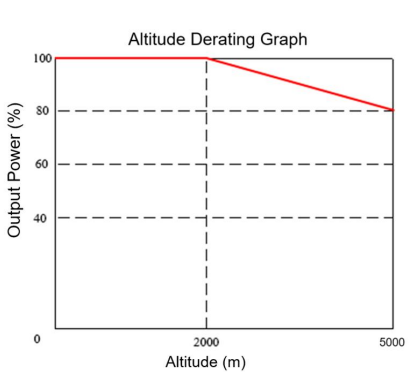
EMC Performance

Items			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

Product Characteristics Graphs







Note 1: The output power should be derated based on the input voltage derating graph at 85~100VAC/120~140VDC & 277~305VAC/390~430VDC.

Note 2: This product should operate under the condition of natural air, please contact us if it could be used at a closed space.

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Recommended EMC Circuit for Application

Typical application circuit diagram

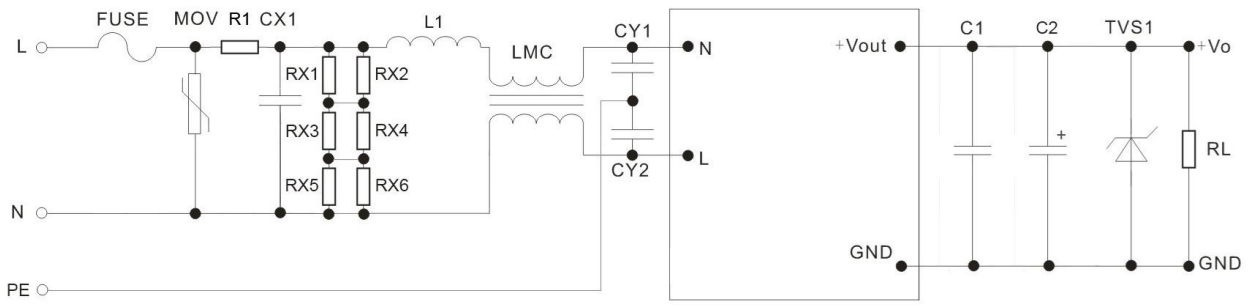
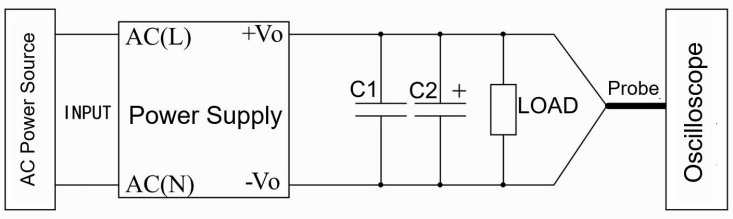


Figure – Circuit 1

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/ 310VAC	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: Both the * marked FUSE & R1 are required for the application.

Ripple & Noise Test Instruction (Parallel-line Method, 20MHz Bandwidth)



1. The Ripple & Noise test needs the cables in parallel, an oscilloscope that should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. One polypropylene capacitor C1(0.1uF) and one high frequency low impedance electrolytic capacitor C2(10uF) are connected in parallel with the probe.
2. Refer to the test diagram, 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 test can start at the converter output terminals after the input power on.

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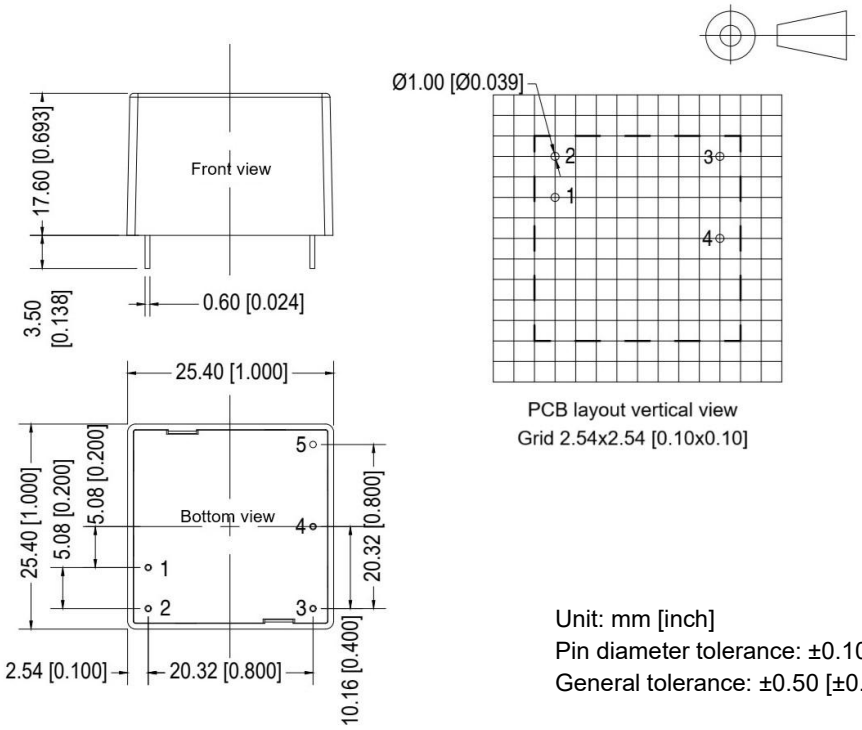
Mechanical Dimensions

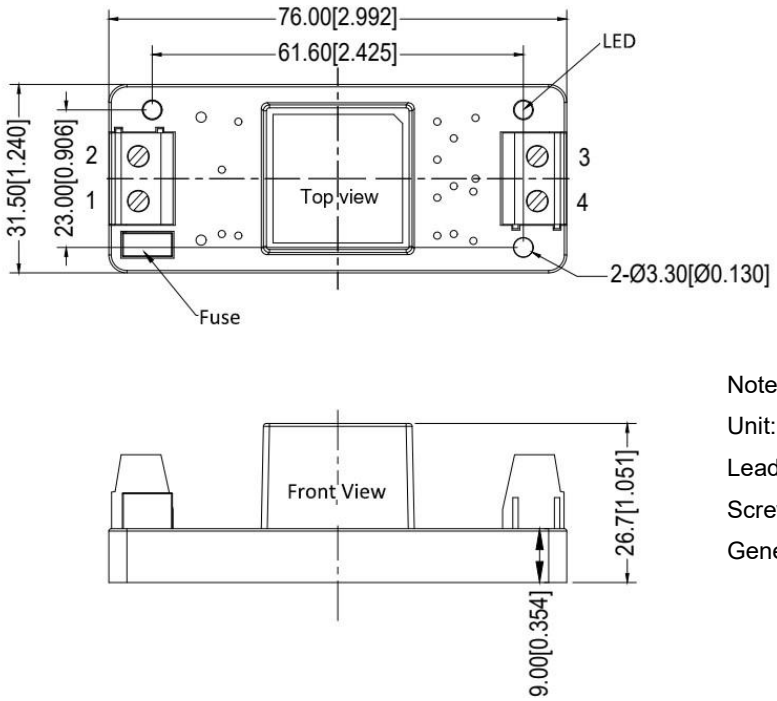


Unit: mm [inch]
Pin diameter tolerance: ±0.10 [±0.004]
General tolerance: ±0.50 [±0.020]

Pin-out Function Description

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

-T Package Mechanical Dimensions



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

Terminal Function Description

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

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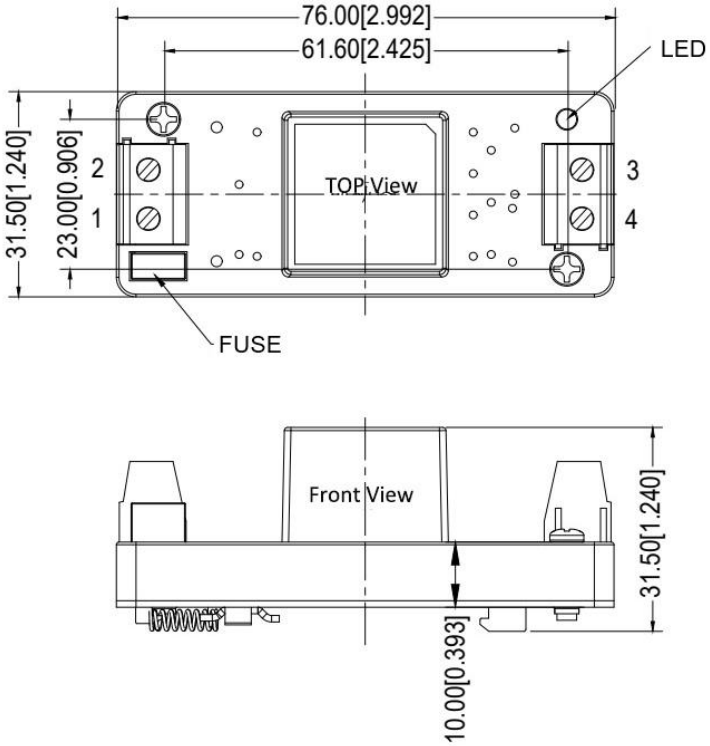
-TS Package Mechanical Dimensions



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

Terminal Function Description

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

Application Notice

1.The product should be used according to the specifications, otherwise it could be permanently damaged.

2. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.

3. The product performance cannot be guaranteed if it works under over-load condition.

4. Unless otherwise specified, all values or indicators on this datasheet are tested at Ta=25℃, humidity<75%RH, nominal input voltage and rated load (pure resistance load).

5. All values or indicators on this datasheet have been tested based on Aipupower test specifications.

6.The specifications are specially for the parts listed on this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.

7. Aipupower can provide customization service.

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