Typical Features

- ◆ Wide input voltage range: 85-305VAC/120-430VDC
- ◆ No load power consumption ≤ 0.25W
- ◆ Transfer Efficiency up to 76%(TYP.)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over current
- ◆ Isolation voltage: 4000Vac
- ◆ Meet IEC62368/UL62368/EN62368 test standard
- ◆ With TUV/CE Certificate
- ◆ PCB mounting

Application Field

FA5-220SXXG2D4(-T)(-TS) 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. EMC and Safety standard meet international EN55032,IEC/EN61000. 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	Efficiency@ Full Load, 220Vac (Typical)
		Power	Voltage	Current			
		(W)	Vo (V)	Io (mA)	uF	mVp-p	%
CE	FA5-220S3V3G2D4	3.3	3.3	1000	2000	100	69
	FA5-220S05G2D4	5	5	1000	2000	100	72
	FA5-220S12G2D4	5	12	416	800	120	75
	FA5-220S12V5G2D4	5	12.5	400	800	120	76
	FA5-220S15G2D4	5	15	333	800	120	76
	FA5-220S24G2D4	5	24	208	300	150	78

Note 1: Due to limited space, the above is only a partial list of products. If you need products outside the list, please contact our sales department.

Note 2: "*" represents a model under development.

Note 3: The typical value of output efficiency is based on the product aging for half an hour at full load.

Note 4: 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 5: -T is a wiring package, and -TS is a guide rail package

Input Specification

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
Input Current	115VAC	-	-	0.12	A
	220VAC	-	-	0.08	
Surge Current	115VAC	-	-	15	
	220VAC	-	-	20	
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
Recommended External Input Fuse	-	2A/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 Consumption		Input 115VAC		-	-	0.25	W
		Input 220VAC		-	-		
Minimum Load		Single Output		0	-	-	%
Start up Delay Time		Nominal input voltage (full load)		-	50	-	mS
Power-off Holding 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
		Tested by twisted pair method, please check “Ripple & Noise Test” at back					

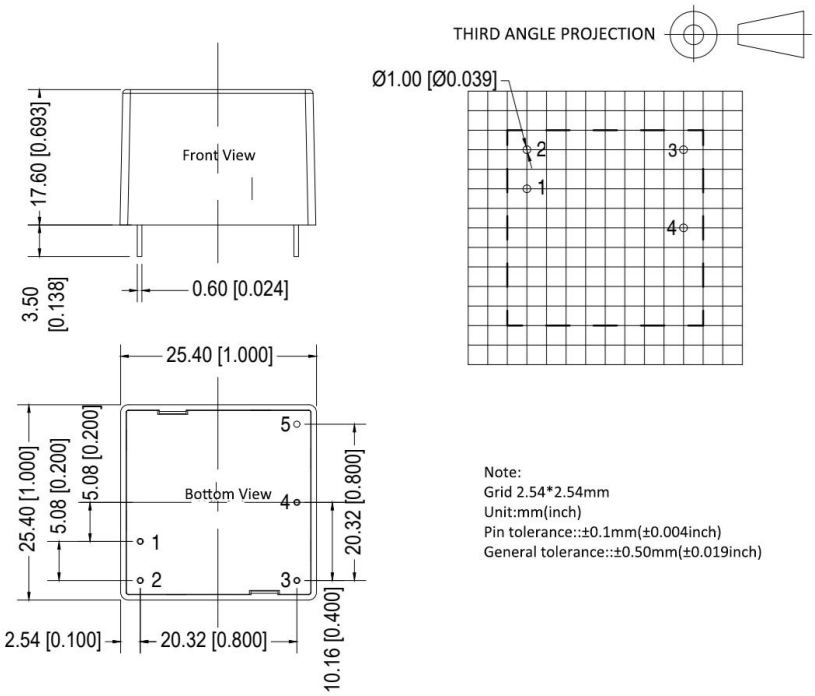
General Specification

Item		Operating Condition	Min	Typ.	Max	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		-	-40	-	+105	℃
Storage Temperature		-	-40	-	+110	
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
	I/P-Case		-	-	-	VAC
	I/P-FG		-	-	-	VAC
Insulation Resistance	I/P-O/P	@ DC500V	100	-	-	MΩ
Safety Standard		-	EN62368, IEC62368			
Vibration		-	10-55Hz,10G,30Min,along X,Y,Z			
Safety Standard		-	CLASS Ⅱ			
Class of Case Material			UL94 V-0			
MTBF		-	MIL-HDBK-217F@25℃＞300,000H			

EMC Characteristics

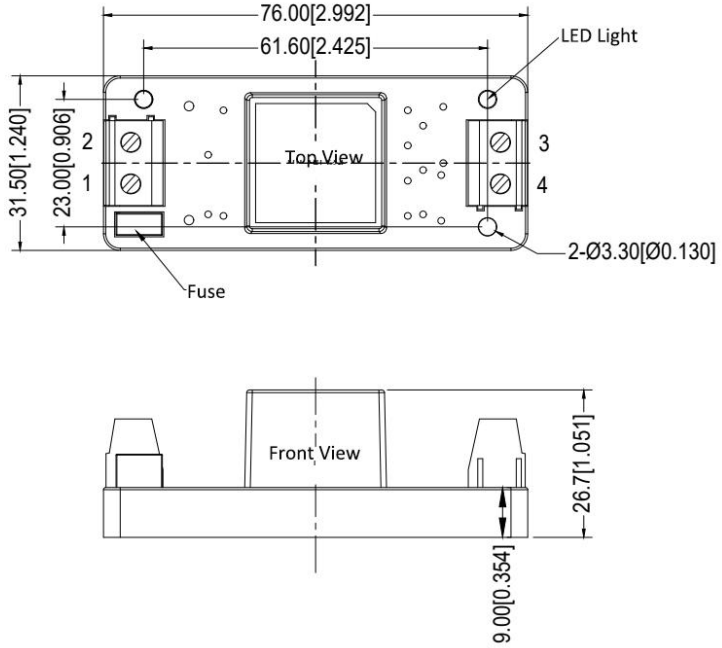
Total Item		Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (Recommended Circuit 1)
		RE	CISPR22/EN55032	CLASS B (Recommended Circuit 1)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (Recommended Circuit 1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (Recommended Circuit 1)
		ESD	IEC/EN61000-4-2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

Dimension



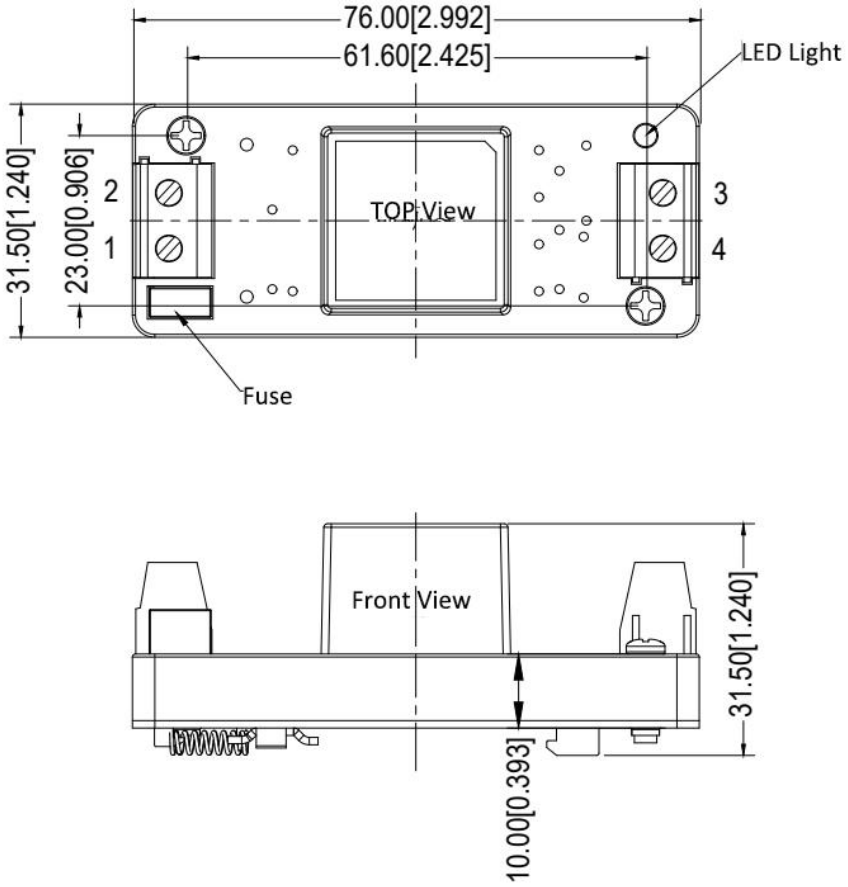
L x W x H		25.4X25.4X17.6 mm		1.000X1.000X0.693inch	
Pin	1	2	3	4	5
Single（S）	AC(L)	AC(N)	+Vo	-Vo	NP

-T Dimension



L x W x H		76.0X31.5X26.7mm		2.992X1.240X1.051inch	
Pin	1	2	3	4	5
Single（S）	AC(L)	AC(N)	+Vo	-Vo	NP

-TS Dimension



L x W x H		76.0X31.5X31.5mm		2.992X1.240X1.240inch	
Pin	1	2	3	4	5
Single（S）	AC(L)	AC(N)	+Vo	-Vo	NP

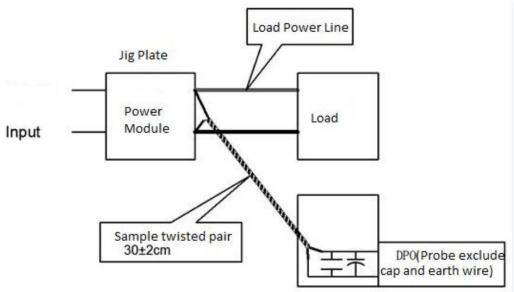
Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

Test method:

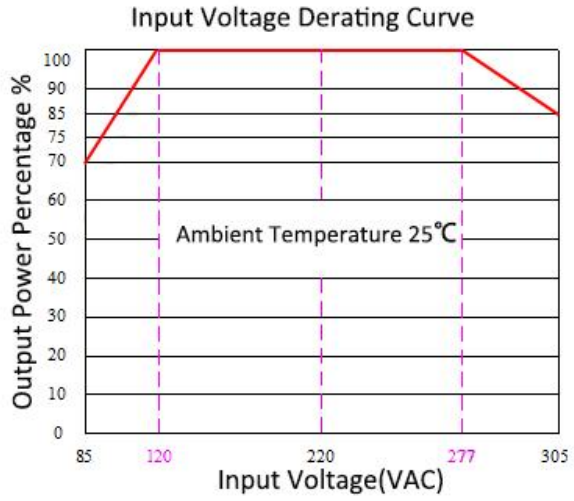
1. Ripple noise is connected using 12# twisted pair cable, the oscilloscope bandwidth is set to 20MHz, 100M bandwidth probe, and 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor are connected in parallel on the probe end, and the oscilloscope sampling uses Sample sampling mode.

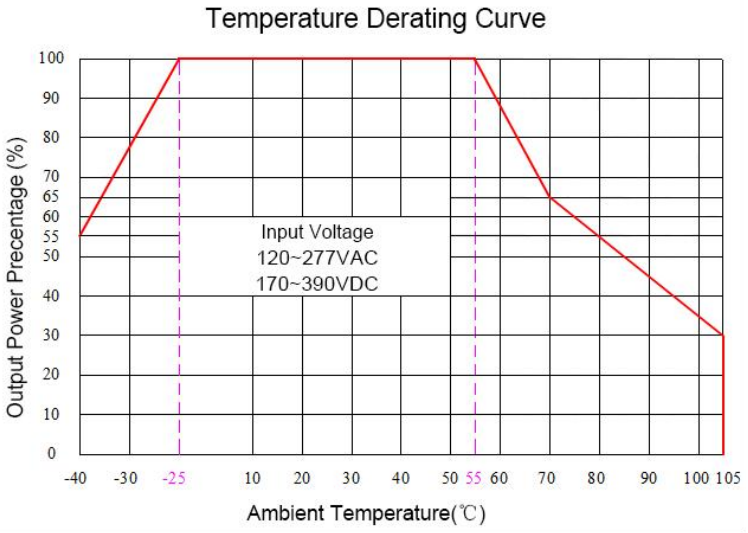
2. Output ripple noise test diagram:

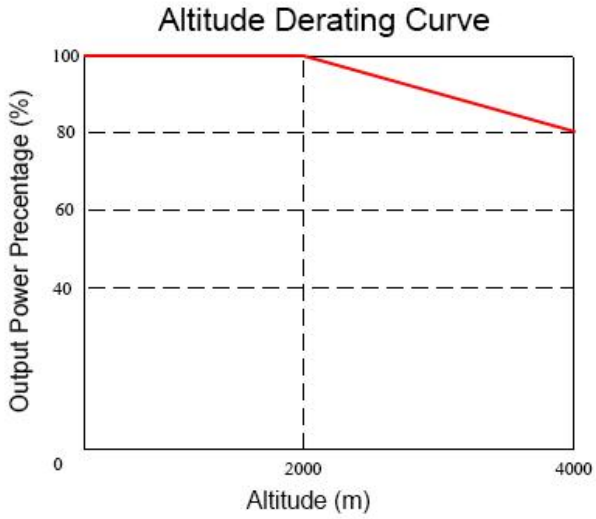
Connect the power input end to the input power supply, and the power output is connected to the electronic load through the fixture board. The test is performed using a 30cm ± 2 cm sampling line to directly sample from the power output port. The power line selects the corresponding wire diameter with insulated wire according to the output current.



Product Characteristic Curve



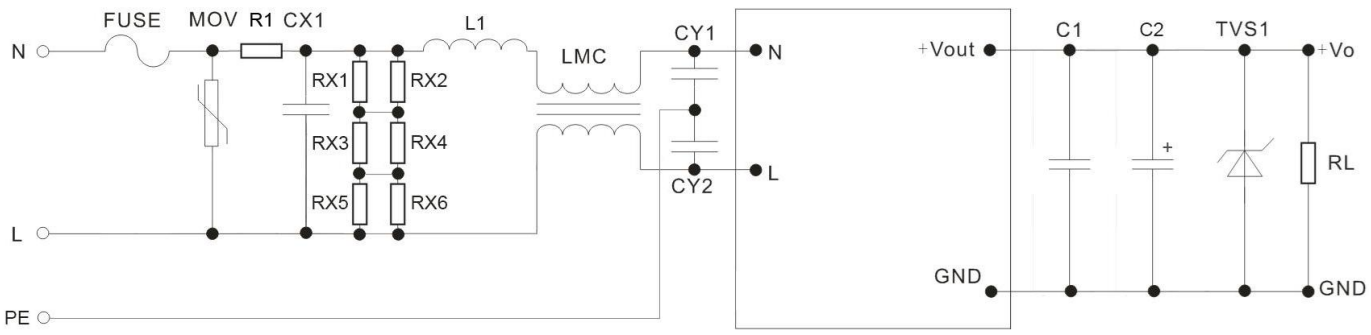




Note 1: Input Voltage should be derated based on Input voltage derating curve when it is 85~120VAC/277~305VAC/120~170VDC/390~430VDC.

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

Typical EMC Recommended Circuit



Recommended Circuit 1

Part	FUSE (necessary)	MOV	R1	CX1	RX1、RX2、RX3、RX4、RX5、RX6	L1	LMC	CY1、CY2	C1	C2	TVS1
FA5-220S3V3G2D4	2A/250V (Slowing Fuse)	14D561K	33Ω/3W (Wire-wound resistor)	334/305 VAC	1206, 1.5M	1.2mH /0.3A	20mH	1nF /400 VAC	1uF/ 50V	100uF/16V	SMBJ7.0A
FA5-220S05G2D4											
FA5-220S12G2D4										68uF/16V	SMBJ20A
FA5-220S12V5G2D4											
FA5-220S15G2D4											
FA5-220S24G2D4										47uF/35V	SMBJ30A

Note:

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℃, 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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