Typical Features

- ◆ Wide input voltage range 85-305VAC/120-430VDC
- ◆ No load power consumption ≤0.2W@220VAC
- ◆ Efficiency up to 82% (Typ.)
- ◆ Operating temperature from -40°C to +75°C
- ◆ Switching frequency 65KHz
- ◆ Short circuit, over current & over temp. protections
- ◆ Isolation voltage 4000VAC
- ◆ Altitude during operation 4000m Max
- ◆ Conform to CE regulations
- ◆ Enclosed plastic case, flame class UL94-V0
- ◆ PCB DIP Mounting

Application Field

FA5-220SXXY2N4 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. This series of products can be widely used in the fields of Electric power, Industrial, Office and Household devices, etc. Additional circuit diagram for EMC is recommended for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Input Voltage Range		Output Specification			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	%
-	FA5-220S3V3Y2N4	220	85-305	4.1	3.3	1250	5000	100 (#)	73
-	FA5-220S05Y2N4			5	5	1000	5000	100 (#)	76
-	FA5-220S12Y2N4				12	416	4000	150	82
-	*FA5-220S15Y2N4				15	333	3000	150	83
-	*FA5-220S24Y2N4				24	208	100	200	84

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 minimum efficiency shall be -2% of the typical value in this table.
Note 3: The suffix -T indicates the chassis package, -TS indicates the package of DIN Rail which width is 35mm.
Note 4: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.
Note 5: The * marked parts have been developed in process
Note 6: The # marked Ripple & Noise values of FA5-220S3V3Y2N4 & FA5-220S05Y2N4 need be tested with an external circuit, see recommended circuit 2.

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	-	47	50	63	Hz
Input current	Input 115VAC	-	-	0.20	A
	Input 220VAC	-	-	0.10	
Surge current	Input 115VAC	-	-	16	A
	Input 220VAC	-	-	30	
Standby power consumption	Input 115VAC	-	-	0.2	W
	Input 220VAC	-	-		
Leakage current	-	0.5mA TYP/230VAC/50Hz			
External fuse Recommended	-	2A/300VAC Time-delay fuse			
Hot-plug	-	Unavailable			

Output Specifications

Item		Test Condition		Min.	Typ.	Max.	Unit
Output voltage accuracy		Full input voltage range, any load	Vo=3.3V	-	±2.0	±4.0	%
			Others	-	±2.0	±3.0	%
Line regulation		Rated Load		-	-	±0.5	%
Load regulation		Nominal input voltage, 20%~100% load		-	-	±5.0	%
Minimum load		Single Output		0	-	-	%
Temperature drift coefficient		-		-	-	±0.03	%/℃
Turn-on delay time		Input 115VAC (full load)		-	-	1000	mS
		Input 220VAC (full load)		-	-		
Power-off hold up time		Input 115VAC (full load)		-	30	-	mS
		Input 220VAC (full load)		-	80	-	
Dynamic response	Overshoot range	25%~50%~25%		-5.0	-	+5.0	%
	Recovery time	50%~75%~50%		-	-	5.0	mS
Output start-up overshoot		Full input voltage range		≤10			%Vo
Short circuit protection				Continuous, Self-recovery			Hiccup
Over current protection		Input 220VAC		150%Io	-	220%Io	mA
Over voltage protection		Output 5VDC		≤7.5			VDC
		Output 12VDC		≤18			
		Output 15VDC		≤20			
		Output 24VDC		≤30			
Ripple & Noise		5%-100% load, 20MHz bandwidth		-	-	200	mVp-p
Note: The Ripple& Noise is tested by the Parallel-line method, please refer to the following test instruction.							

General Specifications

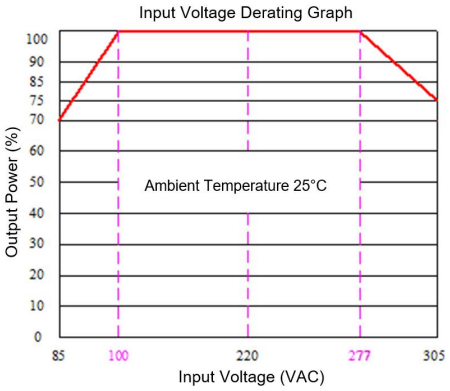
Items	Test Conditions		Min.	Typ.	Max.	Unit
Switching frequency	-		61	65	75	KHz
Operating temperature	Refer to the temperature derating graph		-40	-	+75	℃
Storage temperature	-		-40	-	+85	
Soldering temperature	Wave-soldering		260±4℃, timing 5-10S			
	Manual-soldering		360±8℃, timing 4-7S			
Relative 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℃		300	-	-	K hours
Vibration	-		10-55Hz, 10G, 30Min, along X, Y, Z			
Safety class	-		CLASS Ⅱ			

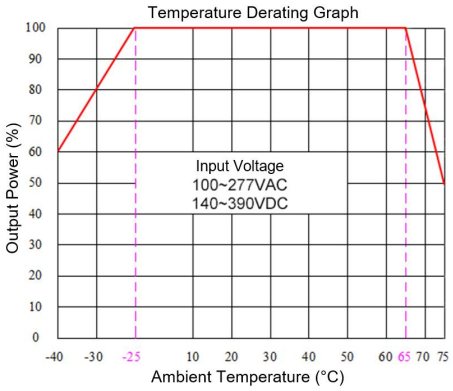
Weights & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H	
	FA5-220SXXY2N4	30g	50.80X25.40X15.60 mm	2.000X1.000X0.614 inch
	FA5-220SXXY2N4-T	50g	76.00X31.50X24.50 mm	2.992X1.240X0.965 inch
	FA5-220SXXY2N4-TS	70g	76.00X31.50X29.00 mm	2.992X1.240X1.142 inch

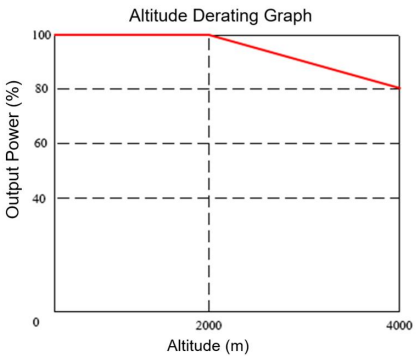
EMC Performance

Items			Test Standards	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended EMC Circuit 1)
		RE	CISPR32/EN55032	CLASS B (with the Recommended EMC Circuit 1)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf. Criteria A
		CS	IEC/EN61000-4-6	10Vr.m.s Perf. Criteria A
		ESD	IEC/EN61000-4-2	Contact ±8KV, Air ±15KV Perf. Criteria B
		Surge	IEC/EN61000-4-5	Line to line ±1KV Perf. Criteria B
				Line to line ±2KV Perf. Criteria B (with the Recommended EMC Circuit 1)
		EFT	IEC/EN61000-4-4	±1KV Perf. Criteria B
				±2KV Perf. Criteria B (with the Recommended EMC Circuit 1)
		PFMF	IEC/EN61000-4-8	10A/m Perf. Criteria A
		Voltage dips & interruptions	IEC/EN61000-4-11	0%~70% Perf. Criteria B

Product Characteristic 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.

Recommended Circuits for Application

1. Recommended EMC circuit diagram

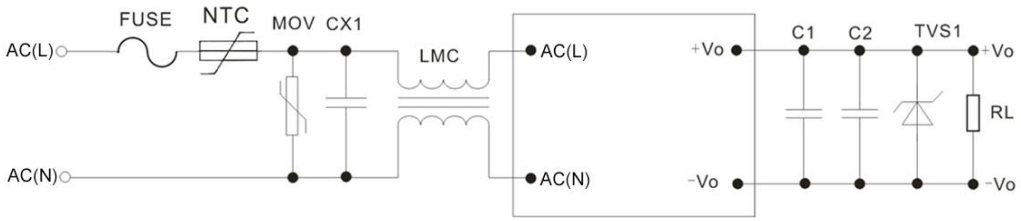


Figure – Circuit 1

FUSE	2.0A/300VAC time-delay fuse (required)	NTC	10D-11
MOV	14D561K/4500A	LMC	40mH/0.5A
CX1	X2/104K/310VAC	TVS1	See note below

Note:

1) A high frequency low impedance electrolytic capacitor is recommended for C1 which capacitance should be less than the Max capacitive load and withstanding voltage more than 1.5x of the output voltage.

2) 0.1uF ceramic capacitor is recommended for C2 which withstanding voltage should be more than 1.5x of the output voltage.

3) TVS1: SMBJ7.0A for 3.3V & 5V outputs; SMBJ12.0A for 9V output; SMBJ20A for 12V & 15V outputs; SMBJ30.0A for 24V output; SMBJ64A for 48V output.

2. Recommended circuit diagram for FA5-220S3V3Y2N4 & FA5-220S05Y2N4 to decrease Ripple & Noise values

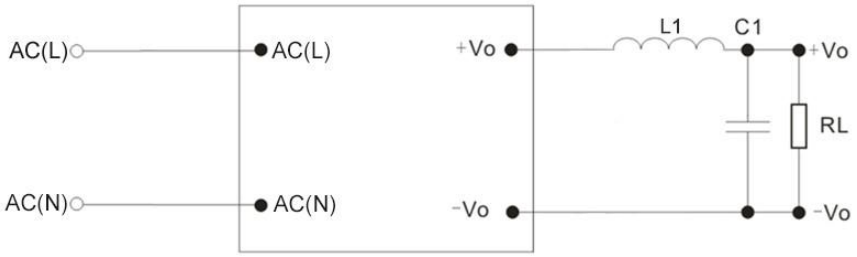


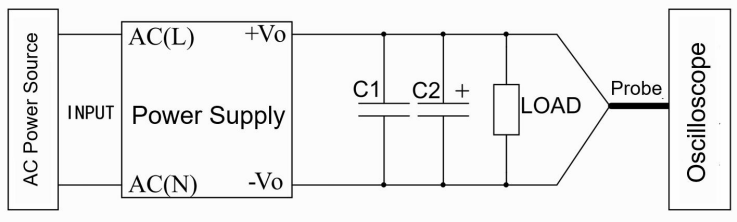
Figure – Circuit 2

Note:

1) 220uF/10V solid-state capacitor is recommended for C1

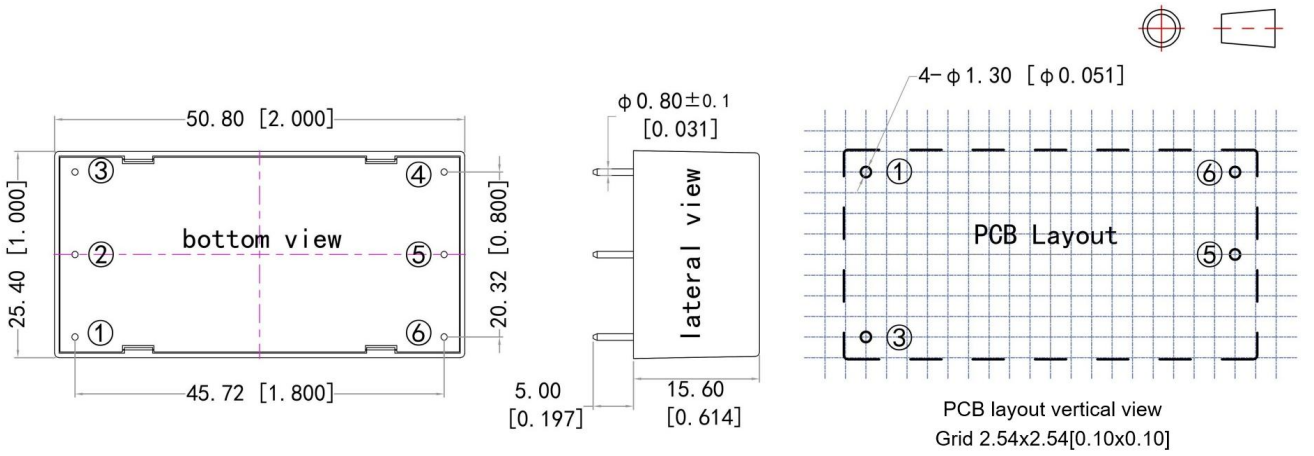
2) 2.2uH Drum choke is recommended for L1 which wire diameter should be more than 0.4mm.

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.

Mechanical Dimensions

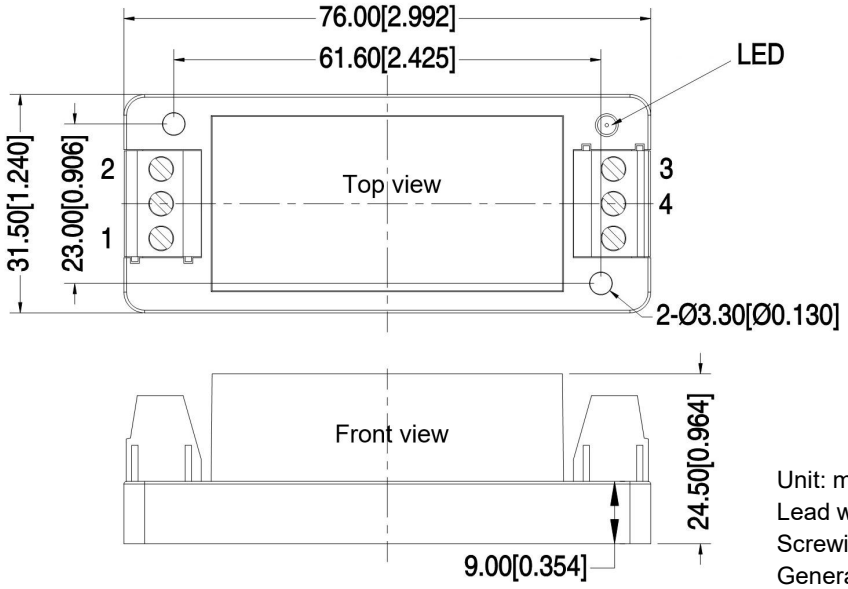


Unit: mm[inch]
General tolerance: ±0.50[±0.020]
Pin diameter tolerance: ±0.10[±0.004]

Pin-out Function Description

Pin No.	1	2	3	4	5	6
Function	AC(N)	No Pin	AC(L)	No Pin	-Vo	+Vo

(-T) Mechanical Dimensions

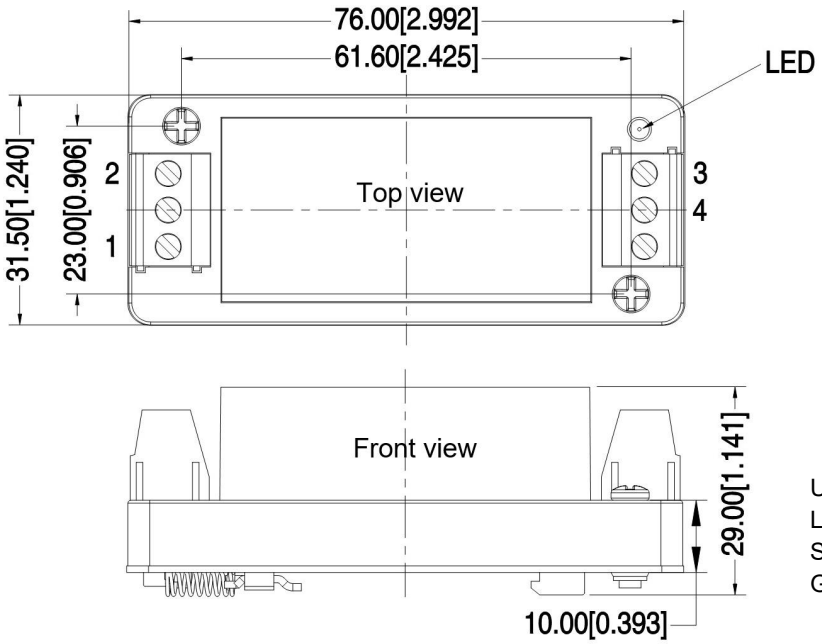


Unit: mm[inch]
Lead wires gauge: 24-12AWG
Screwing torque: 0.4N.m Max
General tolerance: ±1.00[±0.039]

Terminal Function Description

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

(-TS) Mechanical Dimensions



Unit: mm[inch]
Lead wires gauge: 24-12AWG
Screwing torque: 0.4N.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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