Typical Features

- ◆ Wide input voltage range 85-305VAC/120-430VDC
- ◆ No-load power consumption ≤0.25W
- ◆ Efficiency up to 81% (Typ.)
- ◆ Operating temperature from -40℃ to +75℃
- ◆ Switching frequency 65KHz
- ◆ Short circuit & over current protections
- ◆ Isolation voltage 4000VAC
- ◆ Max. Operating Altitude: 2000m
- ◆ Compliant with IEC/EN/UL62368 Standards
- ◆ CE/RoHS Certified, 90-264 VAC Input
- ◆ PCB Mount, Through-hole

Application Fields

FA10-220SXXY2D4 Series — Aipu's compact and high-efficiency power modules with a universal input voltage range (AC-DC compatible). This series features low ripple, minimal temperature rise, ultra-low standby power consumption, high efficiency, high reliability, and reinforced safety isolation. These products are widely used in industrial control, office automation, power systems, and smart home applications. For operation in harsh electromagnetic environments, please refer to the recommended application circuits.

Typical Product List

Certificate	Part No.	Input Voltage Range		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)	(μF)	mVp-p	%
CE/RoHS	FA10-220S4V8Y2D4	220	85-305	10	4.8	2083	6000	100	78
CE/RoHS	FA10-220S05Y2D4				5	2000	3000	100	78
/	FA10-220S7V5Y2D4				7.5	1333	3000	120	80
CE/RoHS	FA10-220S12Y2D4				12	833	2000	120	81
CE/RoHS	FA10-220S24Y2D4				24	416	1000	150	84

Note 1: Typical efficiency measured after 30 min. at full load (burn-in).

Note 2: Full load efficiency (%, Typ.) may fluctuate by ±2%. Efficiency = P_{out} / P_{in}.

Note 3: This list is partial. Contact sales for unlisted models.

Note 4: SμFfix "**-T**" for chassis mount; "**-TS**" for 35mm DIN-rail mount.

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	-	-	0.25	W
	Input 220VAC				
Input Current	Input 115VAC	-	-	0.20	A
	Input 220VAC	-	-	0.15	
Inrush Current	Input 115VAC	-	-	10	A
	Input 220VAC	-	-	20	
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
Hot Plug	-	N/A			
Recommended External Fuse	-	2A/300VAC, Slow-blow type			
Remote Control (Ctrl)	-	N/A			

Output Specifications

Item		Test Condition		Min.	Typ.	Max.	Unit
Output Voltage Accuracy		Full input voltage range, any load	Vo	-	±2.0	±3.0	%
Line Regulation		Rated Load	Vo	-	±1.0	±2.0	%
Load Regulation		Nominal input voltage, 20%~100% load	Vo	-	±1.0	±2.0	%
Ripple & Noise		5%-100% load, 20MHz bandwidth	Vo	-	-	120	mVp-p
		Note 1: Ripple and noise are measured using the parallel cable method. Please refer to the "Ripple & Noise Test Instruction" section for specific test setups and configurations.					
Dynamic Response	Overshoot	25%~50%~25%		-5.0	-	+5.0	%
	Recovery Time	50%~75%~50%		-	-	5.0	ms
Minimum Load		Single output		10	-	-	%
Temperature Coefficient		-		-	-	±0.03	%/℃
Start-up Delay Time		Input 115VAC (full load)		-	-	1500	ms
		Input 220VAC (full load)		-	-		
Hold-up Time		Input 115VAC (full load)		-	10	-	
		Input 220VAC (full load)		-	50	-	
Start-up Overshoot		Full input voltage range		≤10			%Vo
Short Circuit Protection(SCP)				Continuous, Auto-recovery			Hiccup
Over Current Protection(OCP)		Input 220VAC		120%Io	-	250%Io	mA

General Specifications

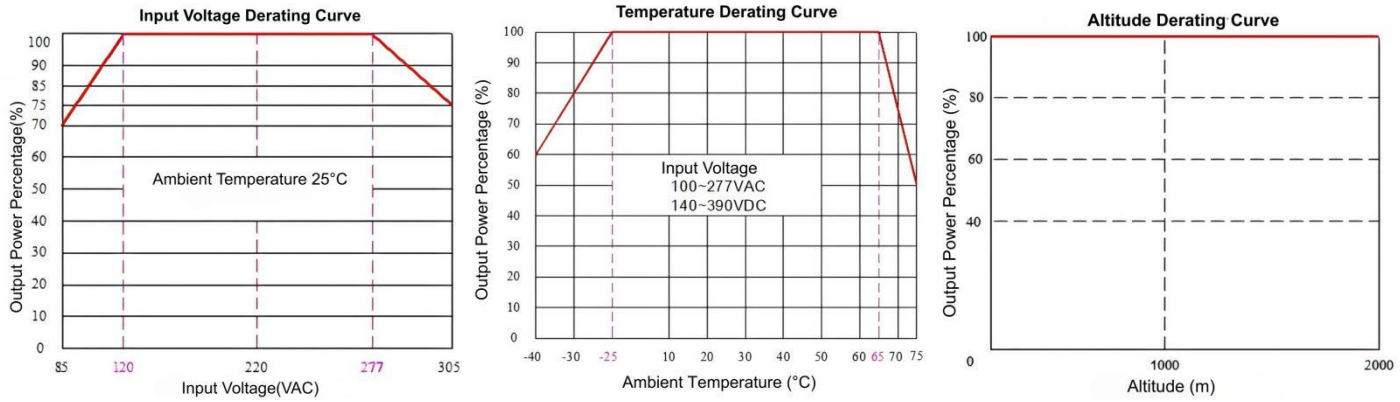
Item	Test Condition	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Refer to the Temperature Derating Curve	-40	-	+75	℃
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave-soldering	260±4℃, 5-10s			
	Manual-soldering	360±8℃, 4-7s			
Relative Humidity	-	10	-	95	%RH

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
Safety Standard	-		IEC/EN62368			
Vibration	10-55Hz, 10G, 30min each axis (X, Y, Z); Complies with GB/T 17626.12, Level 4					
Safety Class	-		CLASS Ⅱ			
Flammability Rating	-		UL94V-0			
Weights & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H			
	FA10-220SXXY2D4	35g	50.8X25.4X15.6 mm	2.000X1.000X0.614inch		
	FA10-220SXXY2D4-T	55g	76.0X31.5X24.5 mm	2.992X1.240X0.965inch		
	FA10-220SXXY2D4-TS	75g	76.0X31.5X29.0 mm	2.992X1.240X1.142inch		

EMC Performance

Test Items			Test Standards	Performance Level / Criteria
EMC	EMI	CE	CISPR32/EN55032	CLASS B
		RE	CISPR32/EN55032	CLASS B
	EMS	RS	IEC/EN61000-4-3	10V/m Perf. Criteria B (Ref. Fig. 1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf. Criteria B(Ref. Fig. 1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV, Perf. Criteria B
		Surge Immunity	IEC/EN61000-4-5	line to line ±2KV / line to ground ±4KV Perf.Criteria B (Ref. Fig. 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: For input voltage ranges of 85-120VAC / 277-305VAC / 120-170VDC / 390-430VDC, temperature derating must be applied based on the input voltage derating curve. (The maximum operating temperature for CE certification is 50°C).

Note 2: This product is designed for natural air convection cooling. Please contact our technical support if the product is intended for use in a sealed environment..

Typical EMC Circuit for Application

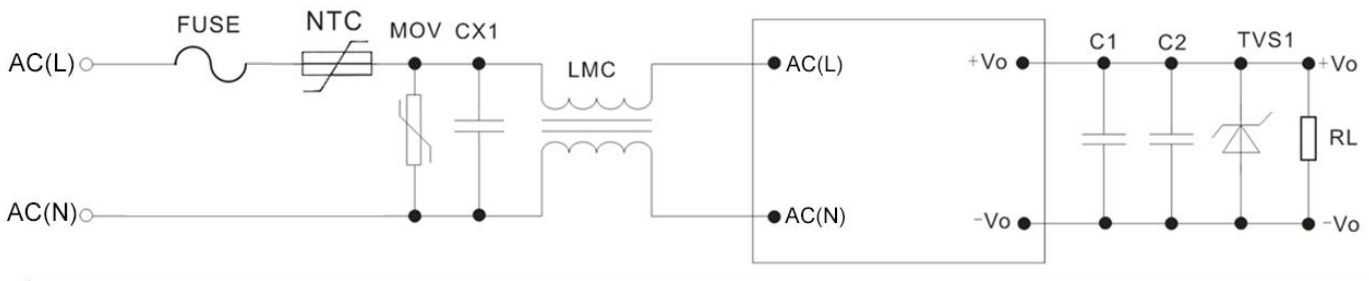


Figure 1

Component	Recommended values	Component	Recommended values
FUSE	2.0A / 300VAC, Slow-blow (Required)	LMC	30mH/0.3A
MOV	10D561K/3500A	NTC	10D-11
CX1	X2/224K/310VAC	TVS1	Refer to Note 1

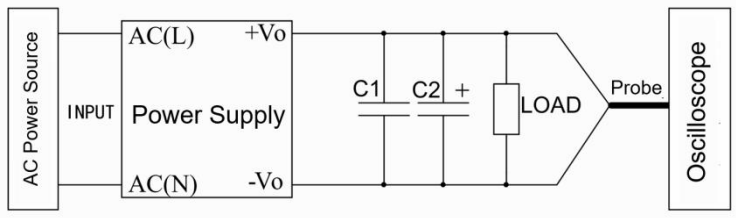
Note 1:

(1) C1: High-frequency, low-impedance electrolytic capacitor. Its capacitance must be lower than the maximum capacitive load, and the voltage rating should be at least 1.5 times the output voltage.

(2) C2: 0.1μF ceramic chip capacitor (MLCC), with a voltage rating of at least 1.5 times the output voltage.

(3) TVS1: TVS diode. Recommended models: SMBJ7.0A for 5V output; SMBJ12.0A for 9V output; SMBJ20A for 12V and 15V output; SMBJ30.0A for 24V output; SMBJ64A for 48V output.

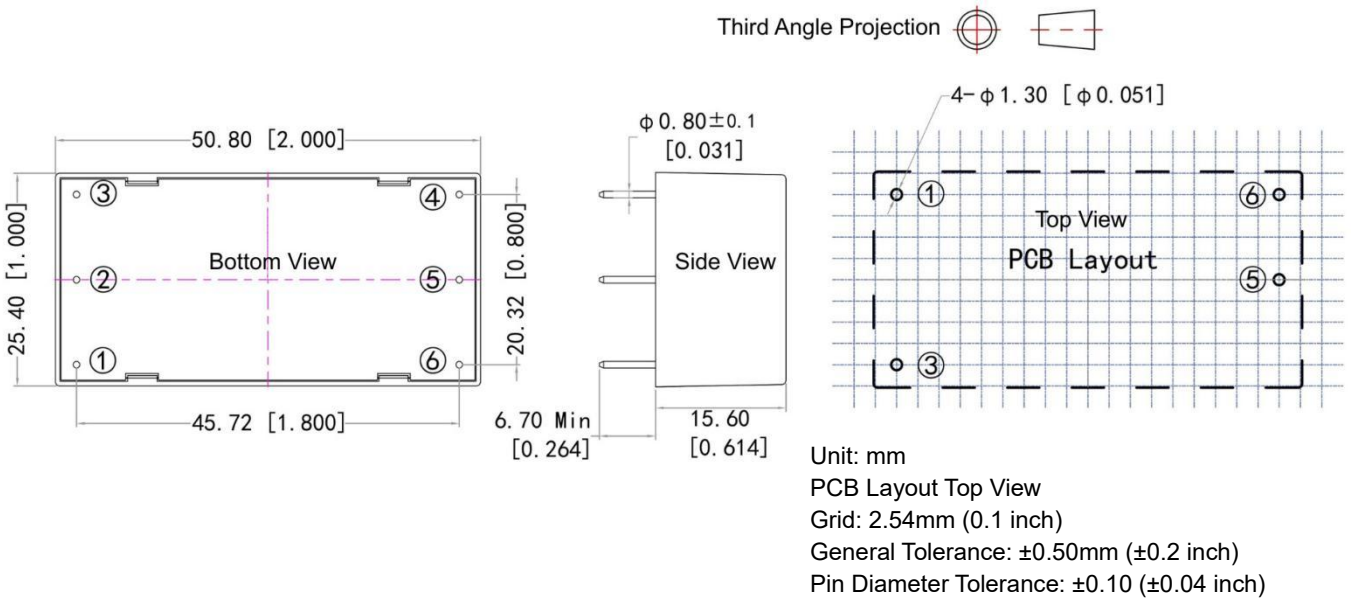
Ripple & Noise Test Instruction (Parallel Cable Method, 20MHz Bandwidth)



1. Ripple & Noise is measured using the parallel-cable method. The oscilloscope bandwidth is set to 20MHz with "Sample" mode. The probe cap and ground lead are removed, while a 0.1μF ceramic capacitor (C1) and a 10μF high-frequency low-impedance electrolytic capacitor (C2) are connected in parallel at the probe tip.

2. Schematic of Output Ripple & Noise Test: Connect the input terminals of the power module to the DC source, and the output terminals to the electronic load via a test jig. Use separate sampling wires to measure directly at the output terminals. Power cables with appropriate gauges and insulation must be selected based on the output current.

Mechanical Dimensions

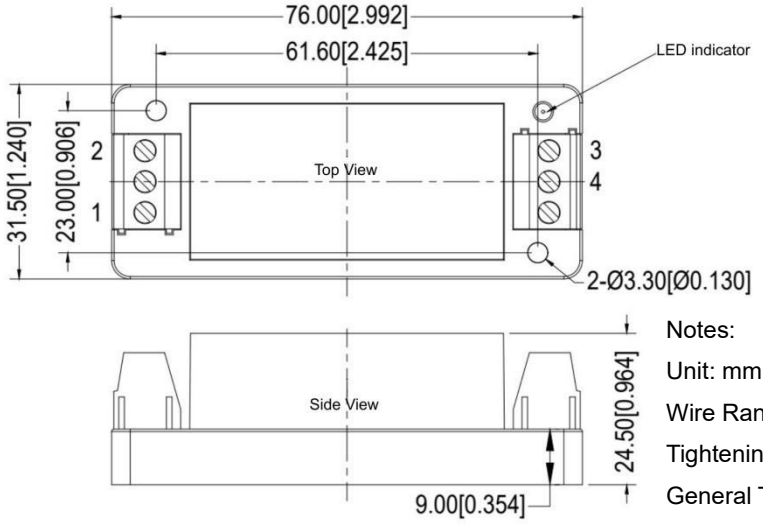


Unit: mm
PCB Layout Top View
Grid: 2.54mm (0.1 inch)
General Tolerance: ±0.50mm (±0.2 inch)
Pin Diameter Tolerance: ±0.10 (±0.04 inch)

Pin Definition

Pin No.	1	2	3	4	5	6
Function	AC(L)	NP	AC(N)	NP	-Vo	+Vo
	AC Input (Line)	No Pin	AC Input (Neutral)	No Pin	Negative Output	Positive Output

Mechanical Dimensions(Chassis Mount,-T SμFfix)

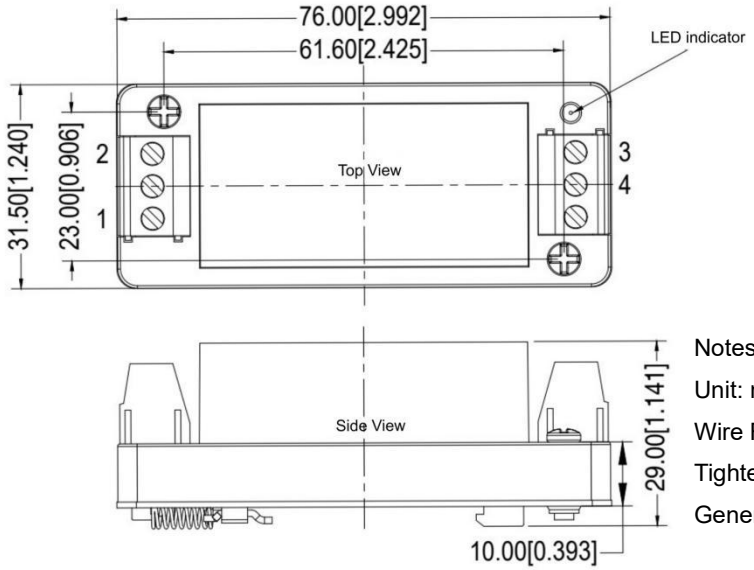


Notes:
Unit: mm [inch]
Wire Range: 24-12AWG
Tightening Torque: 0.4 N·m (Max)
General Tolerance: ±1.00 [±0.039]

Pin Definition

Pin No.	1	2	3	4
Function	AC(N)	AC(L)	+Vo	-Vo
	AC Input (Neutral)	AC Input (Line)	Positive Output	Negative Output

Mechanical Dimensions(DIN-Rail Mount, -TS SμFfix)



Notes:
Unit: mm [inch]
Wire Range: 24-12AWG
Tightening Torque: 0.4 N·m (Max)
General Tolerance: ±1.00[±0.039]

Pin Definition

Pin No.	1	2	3	4
Function	AC(N)	AC(L)	+Vo	-Vo
	AC Input (Neutral)	AC Input (Line)	Positive Output	Negative Output

Application Notice

1. The product must be used within the specified range; otherwise, permanent damage may occur.
2. Product performance cannot be guaranteed if the load is below the minimum required load.
3. Product performance cannot be guaranteed if the product operates outside the specified load range.
4. Unless otherwise specified, all data are measured at Ta=25℃, humidity<75%R, nominal input voltage, and rated output load (pure resistive load).
5. All test methods are based on our corporate standards.
6. The above specifications apply only to the standard models listed in this datasheet. Some specifications for non-standard models may vary. Please contact our technical staff for details.
7. Customized products are available upon request.

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