Typical Features

- Wide input voltage range 85-305VAC/120-430VDC
- Efficiency up to 89%(Typ.)
- No-load power consumption ≤0.45W@220VAC
- Operating temperature from -40℃ to +85℃
- Output short circuit, over current, over voltage protections
- Isolation voltage 4200VAC
- Altitude during operation 5000m Max
- Compliant with IEC/EN62368/UL62368
- PCB DIP mounting

Application Field

FA60-220SXXH2N5 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 and good EMC performance. This series of products can be widely used in the fields of Electric power, Industrial, 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	Item No	Output Specification			Max Capacitive Load @220VAC	Ripple & Noise 20MHz (Max)	Efficiency @Full Load, 220VAC
		Power	Voltage	Current			
		(W)	Vo（V）	Io（A）	uF	mVp-p	% (Typ.)
-	FA60-220S05H2N5	50	5	10	20000	150	87
	FA60-220S12H2N5	60	12	5	5000	150	89
	FA60-220S15H2N5	60	15	4	3000	150	89
	FA60-220S24H2N5	60	24	2.5	1800	150	89

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 indicates the chassis package, -TS indicates the package of DIN Rail.

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
Input current	Input 115VAC	-	-	1.8	A
	Input 220VAC	-	-	1.0	

Surge current	Input 115VAC	-	30	-	A
	Input 220VAC	-	60	-	
No-load power consumption	Input 115VAC	-	-	0.45	W
	Input 220VAC	-	0.3		
Leakage current	-	0.5mA TYP/230VAC/50Hz			
External fuse recommended	-	3.15A/300VAC Time-delay fuse			
Hot plug	-	N/A			
ON/OFF Control	-	N/A			

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	-	-	±1.0	%
Load regulation		Nominal input voltage, 20%~100% load	-	-	±1.5	%
Minimum load		Single Output	0	-	-	%
Turn-on delay time		Nominal input voltage (Full load)	-	1500	-	mS
Power-off Hold up time		Input 115Vac (Full load)	-	8	-	mS
		Input 220Vac (Full load)	-	65	-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%	-10.0	-	+10.0	%
	Recovery time		-	5.0	-	mS
Output overshooting		Full input voltage range	≤10%Vo			%
Short circuit protection			Continuous, Self-recovery			Hiccup
Temperature drift coefficient		-	-	±0.03%	-	%/℃
Over current protection		Input 220VAC	≥130% Io, Self-recovery			Hiccup
Ripple & Noise		Full input voltage range	-	80	150	mV
		Note: It is tested by the twisted pair method (refer to the following test instruction).				
Over voltage protection		5VDC Output	≤6.3			VDC
		12VDC Output	≤16.0			
		15VDC Output	≤25.0			
		24VDC Output	≤35.0			

General Specifications

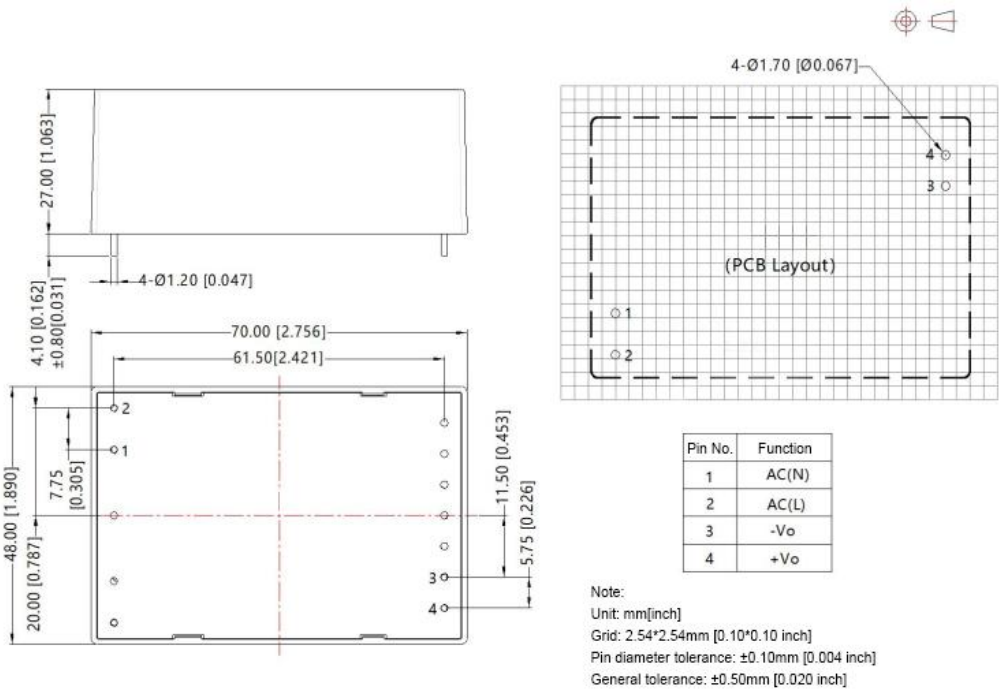
Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching frequency	-	-	65	-	KHz
Operating temperature	Refer to the temperature derating graph	-40	-	+85	℃
Storage temperature	-	-40	-	+85	
Soldering temperature	Wave-soldering	260±4℃, time 5-10S			
	Manual-soldering	360±8℃, time 4-7S			
Relative humidity	-	10	-	90	%RH
Isolation voltage	I/P-O/P, Test 1min, leakage current ≤5mA	4200	-	-	VAC

Insulation resistance	I/P-O/P @DC500V	100	-	-	MΩ
Safety standard	-	EN62368, IEC62368			
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℃	＞500,000H			
Unit weight	Part No.	Weight (Typ.)			
	FA60-220S05H2N5	150g			
	FA60-220S12H2N5-T	200g			
	FA60-220S24H2N5-TS	250g			

EMC Performances

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 dip & interruption	IEC/EN61000-4-11	0%~70% Perf.Criteria B

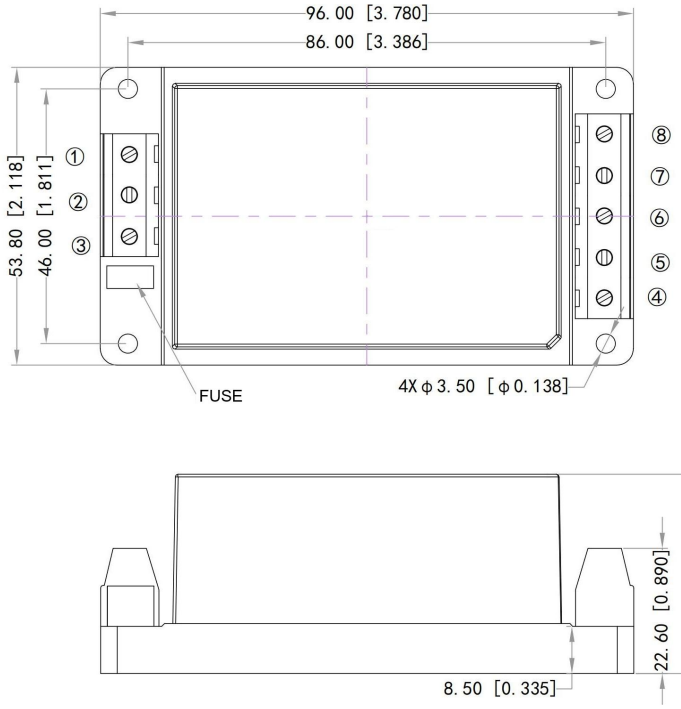
Mechanical Dimensions



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

Note:
Unit: mm[inch]
Grid: 2.54*2.54mm [0.10*0.10 inch]
Pin diameter tolerance: ±0.10mm [0.004 inch]
General tolerance: ±0.50mm [0.020 inch]

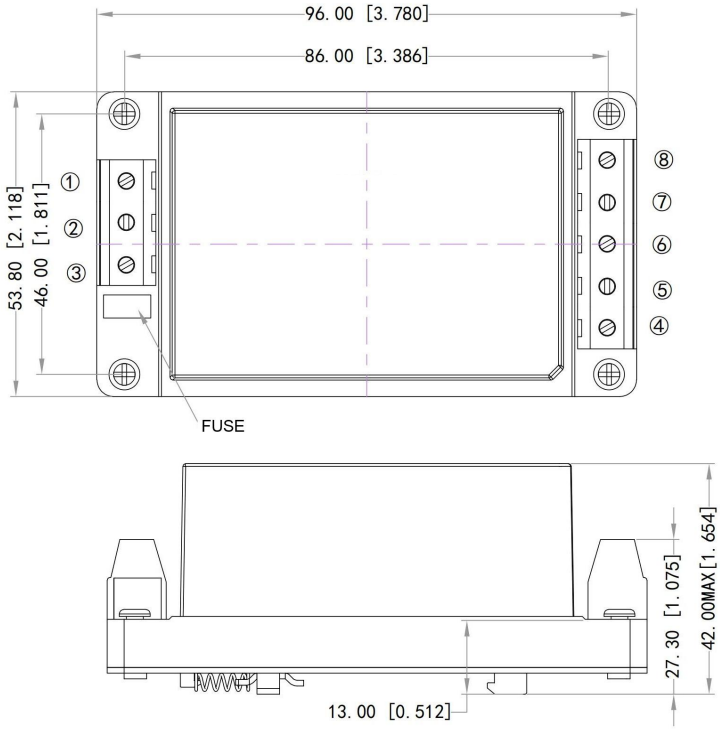
-T Package Mechanical Dimensions



Terminal No.	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

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

-TS Package Mechanical Dimensions



Terminal No.	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

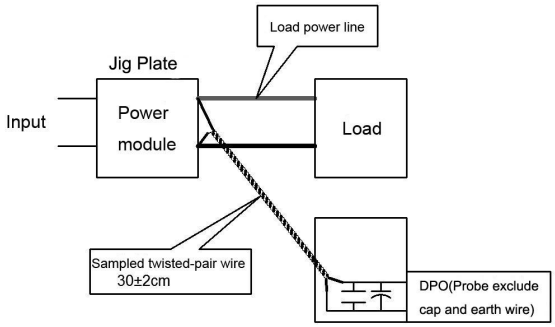
Note:
Unit: mm[inch]
Rail type: TS35(to be Grounded)
Lead wires gauge: 24-12 AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.00[±0.039]

Package Code	Dimensions L x W x H	
-	70.00 X 48.00 X 27.00 mm	2.756 X 1.890 X 1.063 inch
-T	96.00 X 53.80 X 37.00 mm	3.780 X 2.118 X 1.457 inch
-TS	96.00 X 53.80 X 42.00 mm	3.780 X 2.118 X 1.654 inch

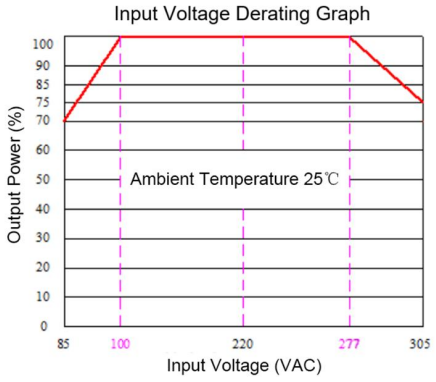
Ripple & Noise Test Instruction (Twisted Pair Method 20MHZ bandwidth)

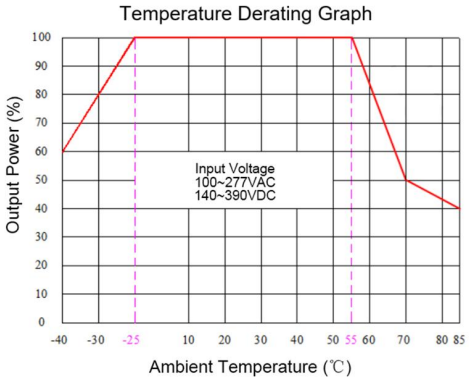
1. The Ripple noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set at 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the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

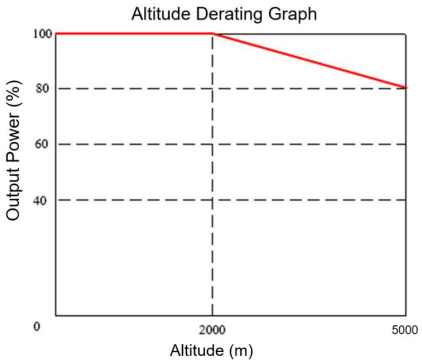
2. The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible 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 the natural air condition, please contact us if it could be used at a closed space.

Recommended typical EMC Circuit

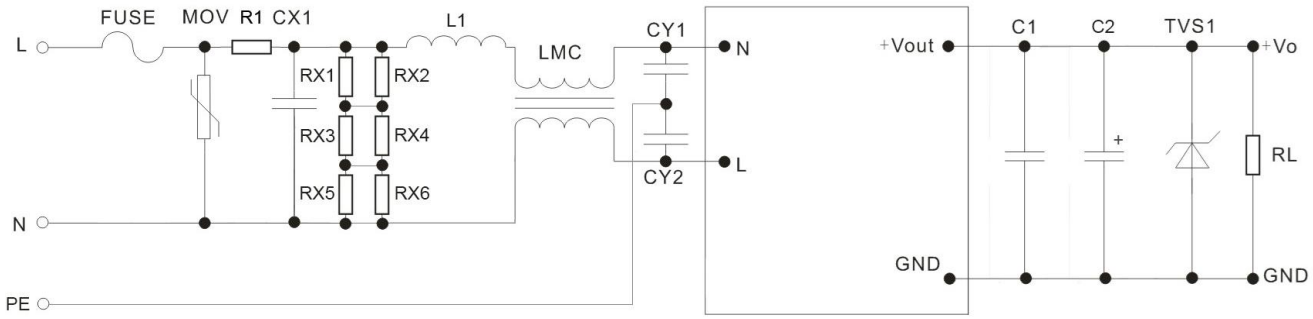


Figure – Circuit 1

Component No.	FA60-220S05H2N5	FA60-220S12H2N5	FA60-220S15H2N5	FA60-220S24H2N5
FUSE (Necessary)	3.15A/300VAC (Time-delay fuse)			
MOV	14D561K/4500A			
R1 (Necessary)	2.0Ω/5W (Wire-wound resistor)			
CX1	X2, 334K/305VAC			
RX1, RX2, RX3, RX4, RX5, RX6	1206/1.0MΩ			
L1	1.2mH/1.5A			
LMC	20mH/1.5A			
CY1, CY2	Y1/1nF/400VAC			
C1	1uF/ 50V			
C2	470uF/16V	330uF/25V	330uF/25V	220uF/35V
TVS1	SMBJ10A	SMBJ20A	SMBJ30A	SMBJ40A

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 at 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