

Typical Features

- ◆ Wide input voltage range 85-305VAC/100-430VDC
- ◆ No-load power consumption $\leq 0.30W@220VAC$
- ◆ Efficiency up to 88%(Typ.)
- ◆ Operating temperature from $-40^{\circ}C$ to $+85^{\circ}C$
- ◆ Switching frequency 65KHz
- ◆ Output short circuit & over current protections
- ◆ Isolation voltage 4200VAC
- ◆ Altitude during operation 4000m Max
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ PCB DIP mounting



Application Field

FA40-220SXXG2D5 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	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)			
-	FA40-220S05G2D5	220	85-305	40	5	8000	7000	100	85
-	FA40-220S12G2D5				12	3333	6000	120	88
-	FA40-220S15G2D5				15	2667	5000	120	88
-	FA40-220S24G2D5				24	1667	800	150	88

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 full load efficiency should be in $\pm 2\%$ 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 3: The Ripple and Noise is tested by the Parallel-line method, please refer to the following test instruction.

Note 4: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input voltage range	AC Input	85	220	305	VAC
	DC Input	100	310	430	VDC
Input frequency range	-	47	50	63	Hz

Input current	Input 115VAC	-	-	0.70	A
	Input 220VAC	-	-	0.45	
Surge current	Input 115VAC	-	-	18	A
	Input 220VAC	-	-	20	
No-load power consumption	Input 115VAC	-	-	0.3	W
	Input 220VAC	-	-		
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	-	-	±0.5	%	
Load regulation	Nominal input voltage, 20%~100% load	-	-	±1.0	%	
Ripple & Noise	5%-100% load, 20MHz bandwidth	-	-	150	mVp-p	
Minimum load	Single Output	0	-	-	%	
Temperature drift coefficient	-	-	±0.03	-	%/°C	
Turn-on delay time	Input 115Vac (Full load)	-	-	1500	mS	
	Input 220Vac (Full load)	-	-			
Power-off hold up time	Input 115Vac (Full load)	10	-	-	mS	
	Input 220Vac (Full load)	20	-	-		
Dynamic Response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-	-	5.0	mS
Output overshooting	Full input voltage range	≤10%Vo			%	
Short circuit protection		Continuous, Self-recovery			Hiccup	
Over current protection	Input 220VAC	≥120% Io, Self-recovery			Hiccup	
Over voltage protection	5VDC Output	≤7.5VDC			Hiccup	
	12VDC Output	≤18VDC				
	15VDC Output	≤20VDC				
	24VDC Output	≤30VDC				

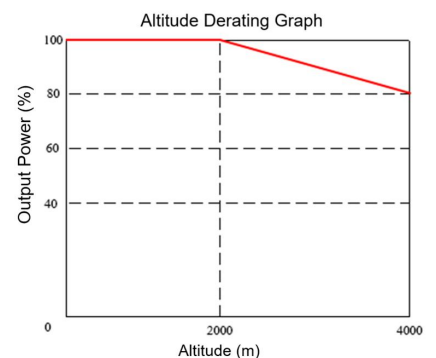
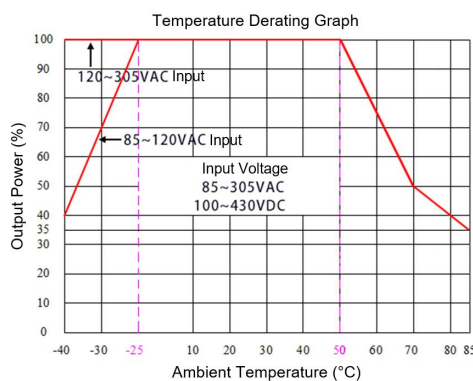
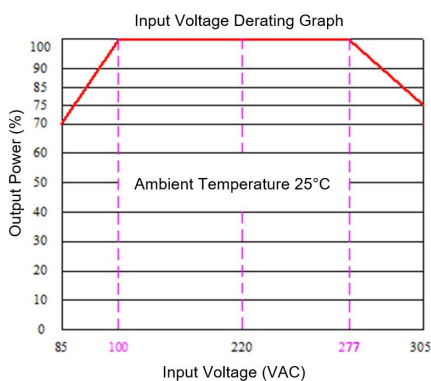
General Specifications					
Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching frequency	-	-	65	-	KHz
Operating temperature	Refer to the temperature derating graph	-40	-	+85	°C
Storage temperature	-	-40	-	+105	
Soldering temperature	Wave-soldering	260±4°C, time 5-10S			
	Manual-soldering	360±8°C, 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
MTBF	MIL-HDBK-217F@25°C		300	-	-	K Hours
Safety standard	-		EN62368, IEC62368			
Vibration	-		10-55Hz, 10G, 30 Min, along X, Y, Z			
Safety class	-		CLASS II			
Weight & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H			
	FA40-220SXXG2D5	125g	71.0 X 41.0 X 32.0 mm		2.795 X 1.614 X 1.260 inch	

EMC Performances

Total Item	Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032 CLASS B (with the recommended circuit 2)
		RE	CISPR32/EN55032 CLASS B (with the recommended circuit 2)
	EMS	RS	IEC/EN61000-4-3 10V/m Perf.Criteria B (with the recommended circuit 2)
		CS	IEC/EN61000-4-6 3Vr.m.s Perf.Criteria B (with the recommended circuit 2)
		ESD	IEC/EN61000-4-2 Contact ±6KV / Air ±8KV Perf.Criteria B (with the recommended circuit 2)
		Surge	IEC/EN61000-4-5 ±1KV Perf.Criteria B (with the recommended circuit 2)
		EFT	IEC/EN61000-4-4 ±2KV Perf.Criteria B (with the recommended circuit 2)
		Voltage dip & interruption	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/277~305VAC & 100~140VDC/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. Typical application circuit diagram

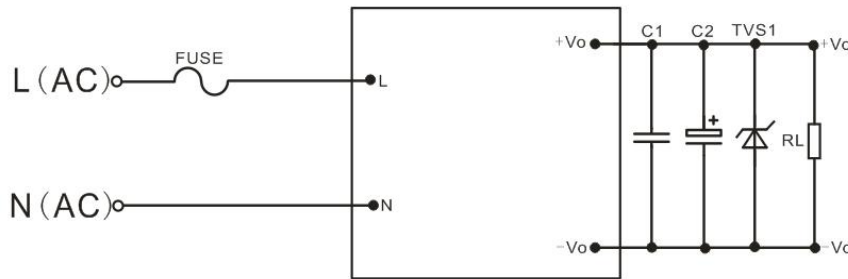


Figure – Circuit 1

Part No.	FUSE (Required)	C1	C2	TVS1
FA40-220S05G2D5	3.15A/300VAC Time-delay fuse	1uF/50V Ceramic SMD capacitor	330uF/16V	SMBJ7.0A
FA40-220S12G2D5			330uF/16V	SMBJ20A
FA40-220S15G2D5			220uF/25V	SMBJ20A
FA40-220S24G2D5			100uF/35V	SMBJ30A

Note:
 High-frequency low resistance electrolytic capacitors are recommended for C2 which capacitance and current should be referred to its manufacturer's specification, it's withstand-voltage should be derated at least 80% of rated. 0.1uF/50V/1206 ceramic SMD capacitor is recommended for C1 to suppress the high frequency noise. TVS1 is recommended to protect the output circuit. FUSE is required for the application, not optional.

2. Recommended EMC circuit for high EMC requirements

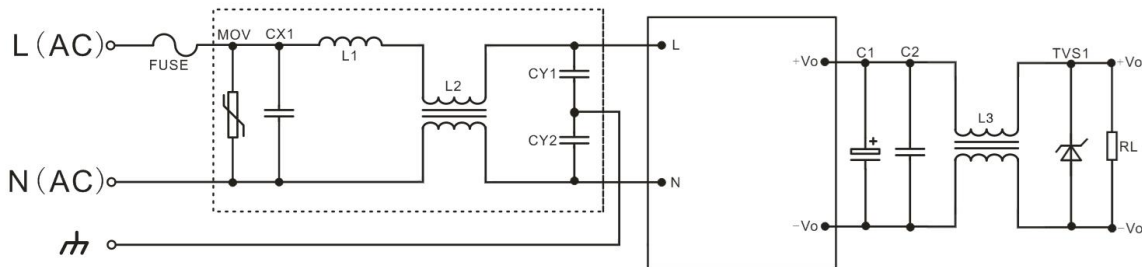
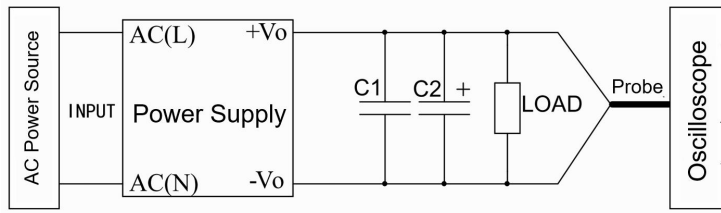


Figure – Circuit 2

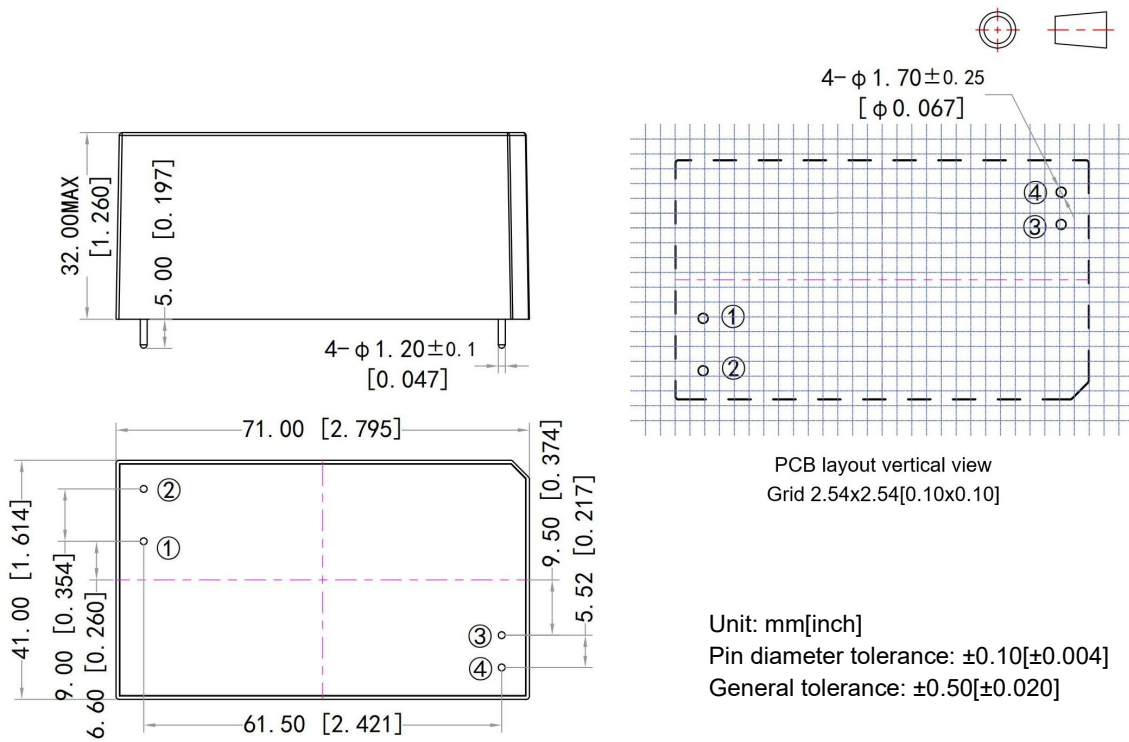
Component	Description & recommended values	
FUSE	Time-delay fuse	3.15A/300VAC (required)
MOV	Varistor	14D561K/4500A
CX1	X capacitor	X2/104K/310VAC
L1	Differential mode choke	2.0uH/2.5A Drum choke
L2	Common mode choke	15mH/2.5A
L3	Common mode choke	145uH/5A
CY1, CY2	Y capacitor	Y1/102M/400VAC

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-resistance 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



Pin-out Function Description

Pin 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. A fuse should be used at the input.
3. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance cannot be guaranteed if it works under over-load condition.
5. Unless otherwise specified, all values or indicators on this datasheet are tested at Ta=25°C, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
6. All values or indicators on this datasheet have been tested based on Aipupower test specifications.
7. 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.
8. Aipupower can provide customization service.

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