AC/DC Converter

FA25-220SXXH2D4 (-T)(-TS) Series

Typical Features

- Input Voltage Range 85-305VAC/120-430VDC
- No load power consumption ≤0.5W@220VAC
- Efficiency 86% (Typ.)
- Operating Temperature from -40℃ to +85℃
- Switching Frequency 65KHz
- Short-circuit protection & Over-current protection
- Isolation voltage 4200VAC
- Compliant with IEC/EN62368/UL62368
- Conform to CE
- Enclosed plastic case, flame class UL94-V0
- PCB DIP Mounting

CE

Application Field

FA25-220SXXH2D4 Series *----- Compact size & high efficiency power supplies with global adapted input voltage (both AC & DC available), low ripple, low temperature rise, low no load power consumption, 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 in this data sheet for the application with higher EMC requirement.*

Typical Product List

Certificate	Part No	Output Specification			Capacitive Load (Max) @220VAC	Ripple & noise 20MHz (MAX)	Efficiency@ Full Load, 220VAC
		Power	Voltage	Current			
		(W)	Vo(V)	Io(mA)	u F	mVp-p	% (Typ.)
CE	FA25-220S05H2D4	21	5.0	4200	3000	100	78
CE	FA25-220S09H2D4	25	9.0	2780	3000	100	85
CE	FA25-220S12H2D4	25	12	2083	2000	120	85
CE	FA25-220S15H2D4	25	15	1667	2000	120	85
-	FA25-220S18H2D4	25	18	1389	2000	120	85
CE	FA25-220S24H2D4	25	24	1042	700	150	85
CE	FA25-220S26V5H2D4	25	26.5	943	500	150	86
CE	FA25-220S28H2D4	25	28	893	500	150	86
CE	FA25-220S29H2D4	25	29.3	853	400	150	86
-	FA25-220S30H2D4	25	30	833	400	150	86
CE	FA25-220S48H2D4	25	48	520	400	150	86

Note 1: The suffix -T indicates a kind of chassis package, -TS indicates a kind of package of DIN Rail which width is 35mm.

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: Please contact Aipu sales for other output voltages requirement in 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	120	310	430	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	100VAC	-	-	0.52	A
	220VAC	-	-	0.30	
Surge Current	115VAC	-	-	15	
	220VAC	-	-	25	
No Load Power Consumption	Input 115VAC	-	0.10	0.50	W
	Input 230VAC	-			
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
Fuse inside	-	3.15A/300VAC Time-delay fuse			
Input Capacitor EC1	-	47uF/450V			
Hot Plug	-	Unavailable			
Remote Control	-	Unavailable			

Output Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range, any load	-	±1.0	±3.0	%
Line Regulation		Rated Load	-	-	±1.0	%
Load Regulation		Nominal input voltage, 20%~100% load	-	-	±1.0	%
Minimum Load		Single Output	5	-	-	%
Turn-on Delay Time		Input 115Vac (full load)	-	800	-	mS
		Input 220Vac (full load)	-		-	
Holde Up Time		Input 115VAC (full load)	-	20	-	mS
		Input 220VAC (full load)	-		-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%	-5.0	-	+5.0	%
	Recovery time		-5.0	-	+5.0	mS
Output Over-shoot		Full input voltage range	≤10%Vo			%
Short circuit protection			Continuous, Self-recovery			Hiccup
Drift Coefficient		-	-	±0.03%	-	%/℃
Over Current Protection		Input 100-305VAC	≥130% Io, Self-recovery			Hiccup
Ripple & Noise		Full input voltage range	-	50	150	mV
		Note: The ripple and noise are tested by the twisted pair method, please refer to the following Ripple & Noise test instruction.				

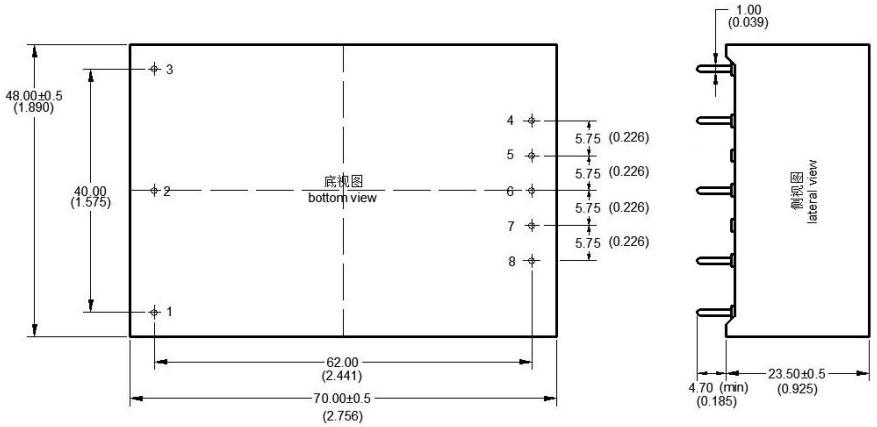
General Specifications

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Refer to the Temperature Derating Graph	-40	-	+85	℃
Storage Temperature	-	-40	-	+90	
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 1 min, leakage current ≤5mA	4200	-	-	VAC
Insulation Resistance	I/P-O/P, @DC500V	100	-	-	MΩ
Safety Standard	-	IEC/EN62368			
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℃ > 300,000H			
Unit Weight	Part No.	Weight (Typ.)			
	FA25-220SXXH2D4	120g			
	FA25-220SXXH2D4-T	165g			
	FA25-220SXXH2D4-TS	200g			

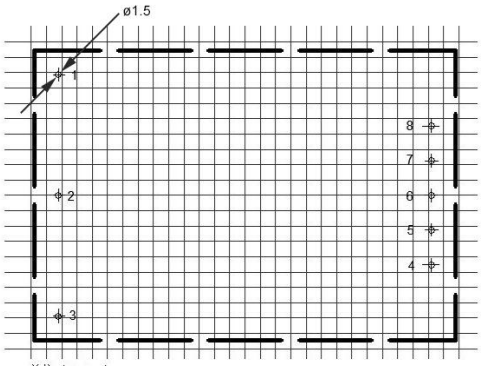
EMC Performances

Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B
		RE	CISPR32/EN55032	CLASS B
	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 ±8KV / Air ±15KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	Line to line ±2KV / line to ground ±4KV Perf.Criteria B
				Line to line ±4KV / line to ground ±6KV Perf.Criteria B (with the Recommended Circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B
				±4KV Perf.Criteria B (with the Recommended Circuit 2)
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

H2 Mechanical Dimensions



Pin No.	Function
1	FG
2	AC(N)
3	AC(L)
4	+Vout
5	No Pin
6	No Pin
7	No Pin
8	-Vout



PCB layout vertical view

Grid 2.54x2.54(0.10x0.10)

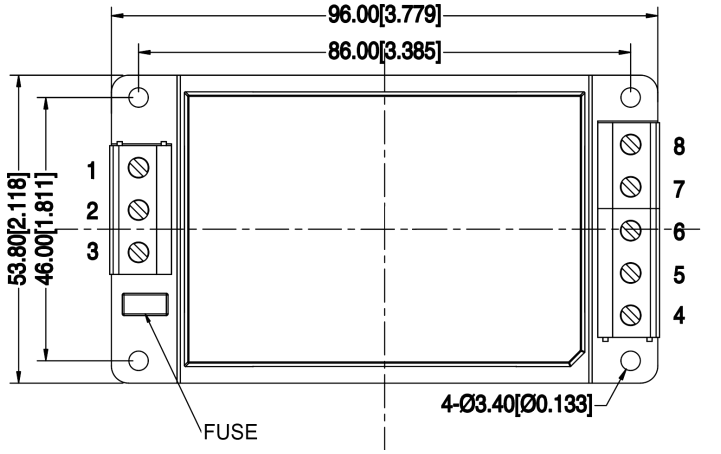
Note:

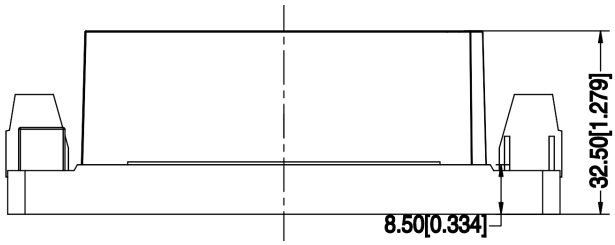
Unit: mm(inch)

Pin diameter tolerance: ±0.10 (±0.004)

General tolerance: ±0.50 (±0.020)

H2 -T Mechanical Dimensions





Terminal No.	Function
1	FG
2	AC(N)
3	AC(L)
4	+Vout
5	No Connection
6	No Connection
7	No Connection
8	-Vout

Note:

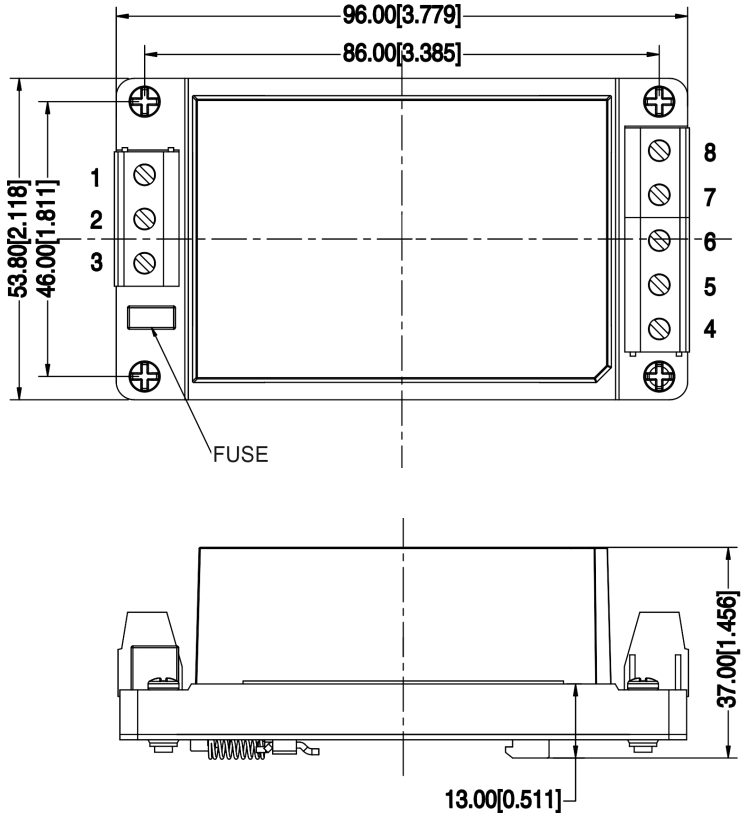
Unit: mm[inch]

Lead wires gauge: 24-12 AWG

Screwing torque: 0.4 N.m Max

General tolerance: ±1.0 [±0.039]

H2 -TS Mechanical Dimensions



Terminal No.	Function
1	FG
2	AC(N)
3	AC(L)
4	+Vout
5	No Connection
6	No Connection
7	No Connection
8	-Vout

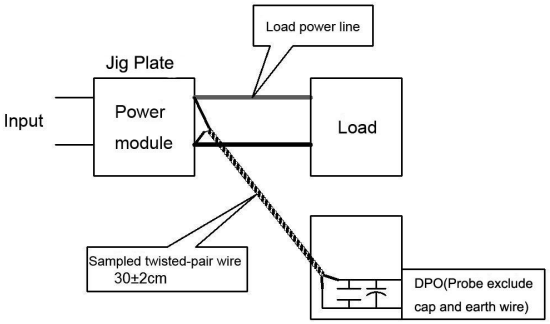
Note:
Unit: mm[inch]
Lead wires gauge: 24-12 AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.0 [±0.039]

Package Code	Dimensions L x W x H	
H2	70.0X 48.0X23.5 mm	2.756X1.890X0.925 inch
H2 -T	96.0X53.8X32.5 mm	3.779X2.118X1.279 inch
H2 -TS	96.0X53.8X37.0 mm	3.779X2.118X1.456 inch

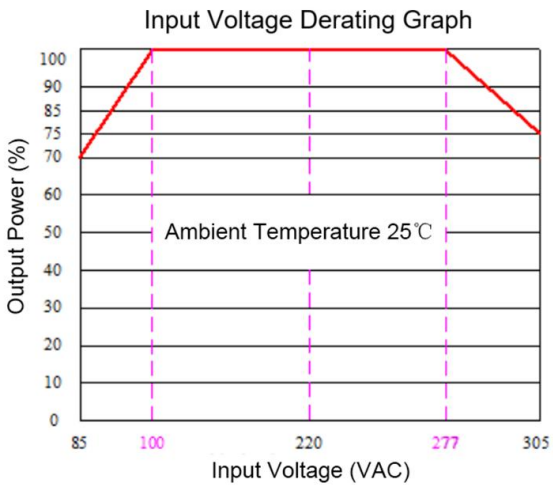
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz Bandwidth)

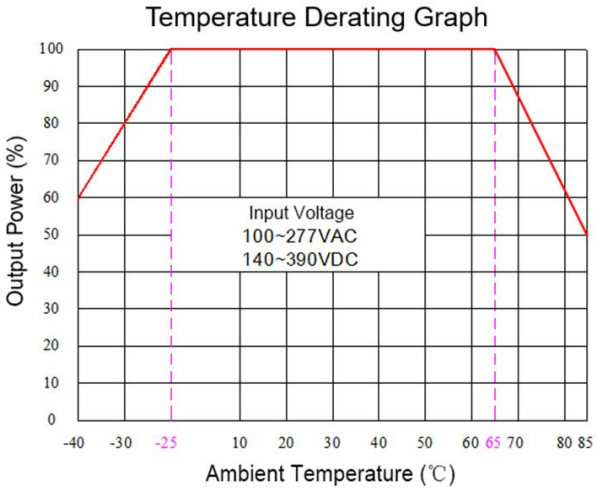
1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the 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 a natural air condition, please contact us if it need be used at a closed space.

Recommended Circuits for Application

1. Typical application circuit diagram

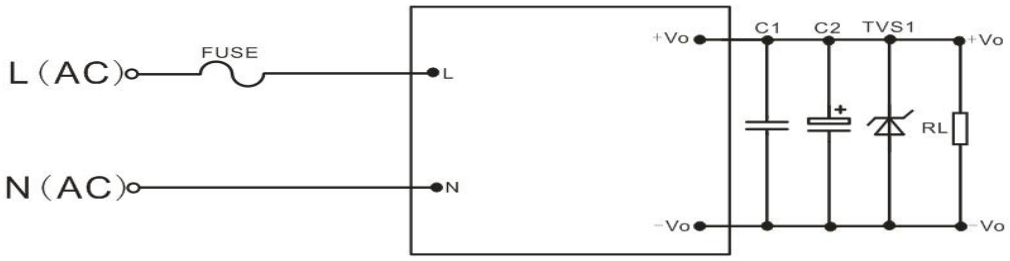


Figure - Circuit 1

Note:

A high-frequency, low-resistance electrolytic capacitor is recommended for C2 which capacitance and current should refer to the technical specifications of its manufacturer. The withstand voltage of C2 should be derated to be at least 80%. C1 is used to suppress the high-frequency noise, ceramic capacitor 0.1uF/50V/1206 is recommended. TVS1 is to protect the output circuit when the power supply operates at abnormal condition. An external FUSE (3.15A/300V Time-delay fuse) is recommended.

Part No.	C2	TVS1
FA25-220S05H2D4	680/10V	SMBJ9A
FA25-220S09H2D4	330/16V	SMBJ12A
FA25-220S12H2D4	330/16V	SMBJ15A
FA25-220S15H2D4	330/25V	SMBJ20A
FA25-220S18H2D4	330/25V	SMBJ30A
FA25-220S24H2D4	220/35V	SMBJ30A
FA25-220S26V5H2D4	220/35V	SMBJ30A
FA25-220S28H2D4	220/35V	SMBJ30A
FA25-220S29H2D4	220/35V	SMBJ33A
FA25-220S30H2D4	220/35V	SMBJ33A
FA25-220S48H2D4	100/63V	SMBJ58A

2. Recommended circuit diagram for EMC

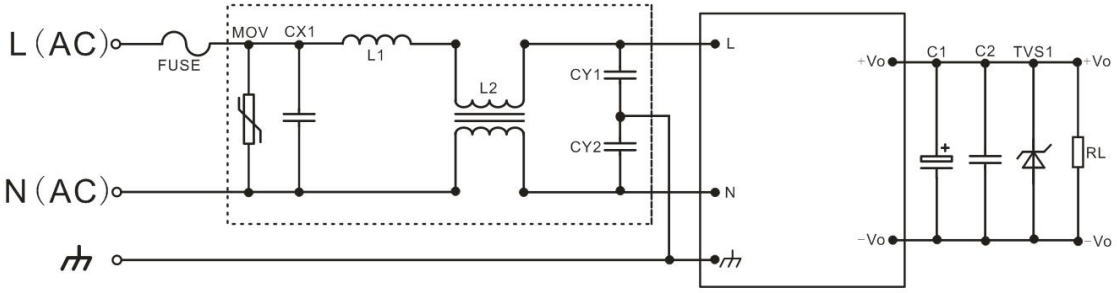


Figure - Circuit 2

Component No.	Description	Recommended Values
FUSE	Time-delay FUSE	3.15A/300VAC (necessary)
MOV	Metal Oxide Varistor	14D561K/4500A
CX1	X Capacitor	X2/224K/310VAC
L1	Differential mode Choke	2.0uH/2.5A Drum choke
L2	Common mode Choke	15mH/2.5A T12X7X6mm
CY1, CY2	Y Capacitor	Y1/102M/400VAC

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.

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