

Typical Features

- ◆ Wide Input Voltage Range: 85-305VAC/120-430VDC
- ◆ No load power consumption $\leq 0.45W$
- ◆ Transfer Efficiency: 86% (typ.)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: Short-circuit, Over-current
- ◆ Isolation voltage: 3800Vac
- ◆ Meet IEC62368/UL62368/EN62368 test standard
- ◆ With CE, RoHS Certificate
- ◆ 6 Side shielding plastic case, meet flammability UL94 V-0
- ◆ PCB Mounting, chassis mounting, din-rail mounting available



Application Field

FA25-220SXXH2D4 Series-----a compact size, high efficient, CE, RoHS approved power converter offered by Aipu. It features universal input voltage range, AC and DC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation, with good EMC performance, meet EN55032, IEC/EN61000 standard. The series widely used for power, industry, instrument, smart home application, etc. The application circuit in the datasheet is strongly recommended for harsh EMC environment.

Typical Product List

Part No	Output Specification					Max. Capacitive Load (MAX)	Ripple & noise 20MHz (MAX)	Efficiency @ Full Load, 220Vac (Typ.)
	Power	Voltage 1	Current 1	Voltage 2	Current 2			
	(W)	Vo1 (V)	Io1 (mA)	Vo2 (V)	Io2 (mA)			
FA25-220S05H2D4	21	5.0	4200	--	--	3000	100	78
FA25-220S09H2D4	25	9.0	2780	--	--	3000	100	85
FA25-220S12H2D4	25	12	2083	--	--	2000	120	85
FA25-220S15H2D4	25	15	1667	--	--	2000	120	85
FA25-220S24H2D4	25	24	1042	--	--	700	150	85
FA25-220S28H2D4	25	28	893	--	--	500	150	86
FA25-220S48H2D4	25	48	520	--	--	400	150	86

Note 1: Suffix “-T” for chassis mounting, “-TS” for din-rail mounting, rail width 35mm.

Note 2: “*” is model under developing.

Note 3: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.

Note 4: The fluctuation range of full load efficiency(% ,TYP) is $\pm 2\%$, full load output efficiency= total output power/module’s input power.

Note 5: Ripple and noise is tested by Twisted pair method, please check details from “Ripple & Noise Test” at back of datasheet.



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	-	-	0.55	A
	220VAC	-	-	0.30	
Surge Current	100VAC	-	-	10	
	220VAC	-	/	20	
No Load Power Consumption	115VAC	-	0.10	0.45	W
	230VAC	-			
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
External Fuse Recommend Value	-	3.15A/250VAC slow-fusing			
Input Terminal Capacitor EC1	-	47uF/450V			
Hot Plug	-	Unavailable			
Remote Control Terminal	-	Unavailable			

Output Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Voltage Accuracy	Full input voltage range, Any load	-	±1.0	±3.0	%
Line Regulation	Nominal 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)	-	500	-	mS
	Input 220Vac (full load)	-		-	
Power-off Holding Time	Input 115VAC (full load)	-	20	-	mS
	Input 220VAC (full load)	-		-	
Dynamic Response	25%~50%~25% 50%~75%~50%	Overshoot range (%): ≤±5.0			%
		Recovery time(mS): ≤5.0			mS



Output Over-shoot	Full input voltage range	≤10%Vo			%
Short circuit protection		Continuous, Self-recovery			Hiccup
Drift Coefficient	-	-	±0.03%	-	%/°C
Over Current Protection	Input 100-265VAC	≥130% Io Self-recovery			Hiccup

General Specifications

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+75	°C
	Derating base on Temperature Derating Curve (see product characteristic curve at back)				
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave-soldering	260±4°C, timing 5-10S			
	Manual-soldering	360±8°C, timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	Input-Output Test 1min, leakage current≤5mA	3800	-	-	VAC
Insulation Resistance	Input-Output @DC500V	100	-	-	MΩ
Safety Standard	-	EN62368、IEC62368			
Vibration	-	10-55Hz,10G,30Min,alongX,Y,Z			
Safety Class	-	CLASSII			
MTBF	-	MIL-HDBK-217F@25°C > 300,000H			

Material Characteristics

Case Material	Black flame-retardant heat-resistant plastic (UL94 V-0)				
Packing Dimension	Horizontal package	70.0X48.0X23.5 mm			
Product Weight		128g(TYP)			
Cooling Method	Natural air cooling				

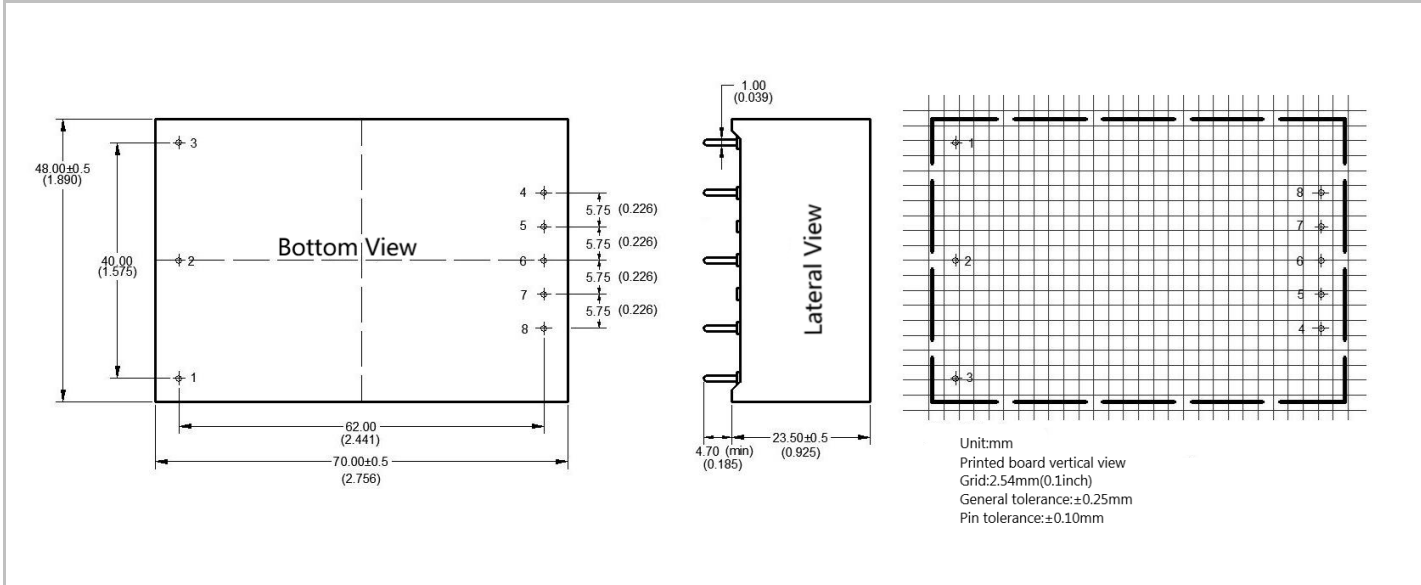
EMC Characteristics

Total Item	Sub Item	Test Standard	Class
EMC	EMI	CE	CLASS B (Bare board)
		RE	CLASS B (Bare board)
	EMS	RS	10V/m Perf.Criteria B (see recommended circuit Photo 2)
		CS	3Vr.m.s Perf.Criteria B (see recommended circuit Photo 2)

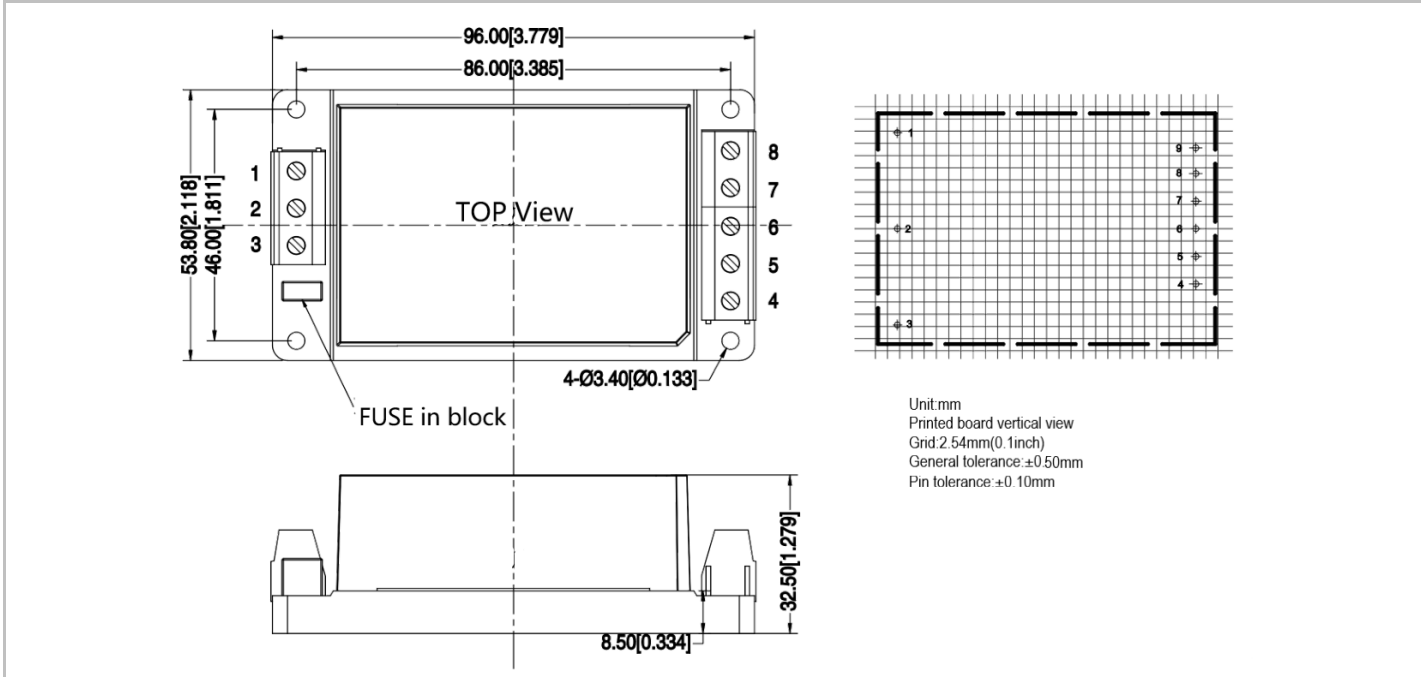


	ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
	Surge	IEC/EN61000-4-5	±1KV Perf.Criteria B (Bare board)
			±2KV Perf.Criteria B (see recommended circuit Photo 2)
	EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (Bare board)
			±4KV Perf.Criteria B (see recommended circuit Photo 2)
Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B	

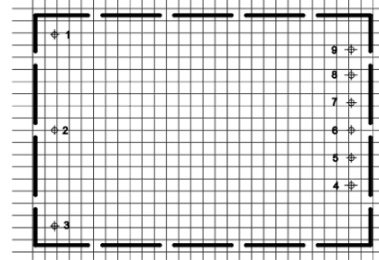
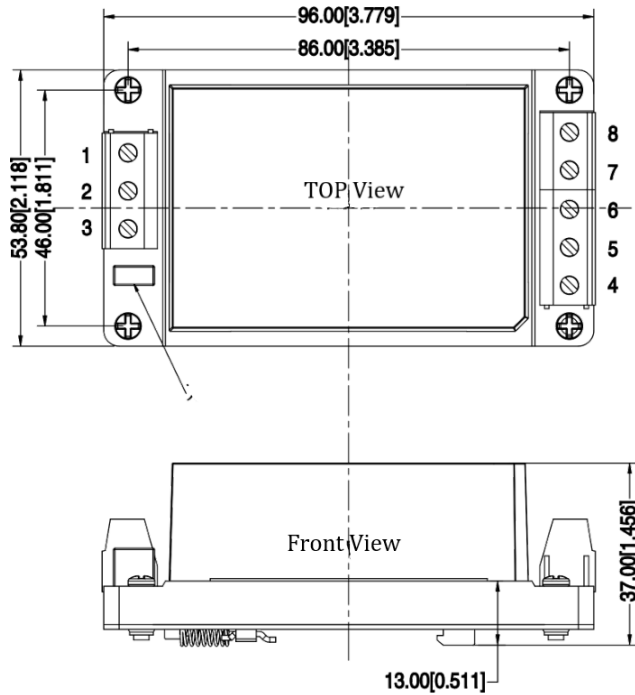
H2D4 Packing Dimension



H2D4-T Packing Dimension



H2D4-TS Packing Dimension



Unit:mm
 Printed board vertical view
 Grid:2.54mm(0.1inch)
 General tolerance:±0.5mm
 Pin tolerance:±0.10mm

Packing Code	L x W x H			
H2	70.0X	48.0X	23.5 mm	2.756X1.890X0.925inch
H2-T	96.0X	53.8X	32.5 mm	3.779X2.118X1.279inch
H2-TS	96.0X	53.8X	37.0 mm	3.779X2.118X1.456inch

Pin Definition

Pin-out	1	2	3	4	5	6	7	8	9
Single (S)	FG	AC (N)	AC (L)	+Vo	NC	NC	NC	-Vo	NC

Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

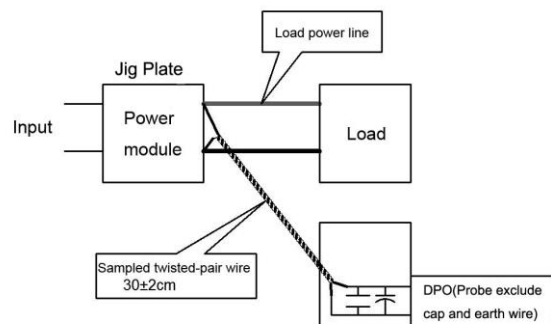
Ripple & Noise Test: (Twisted Pair Method 20MHZ bandwidth)

Test Method:

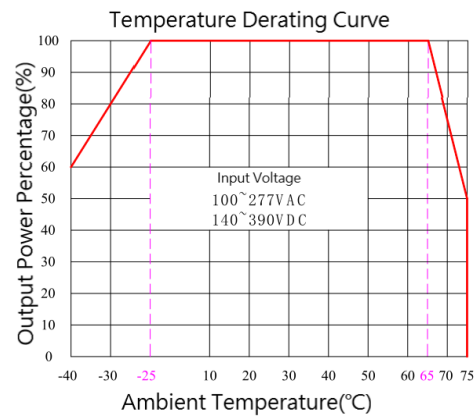
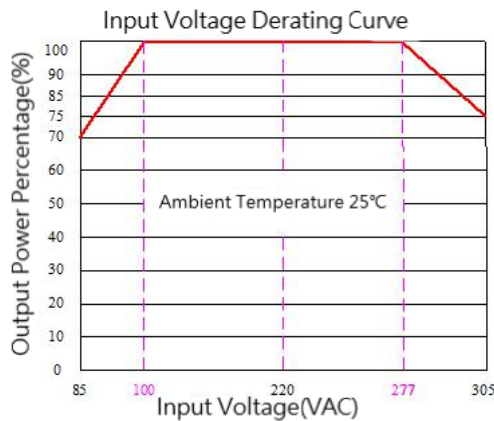
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Output Ripple & Noise Test Method:

Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve



Note

- 1: Input Voltage should be derated base on Input Voltage Derating Curve when it is 85~100VAC/277~305VAC/120~140VDC/390~430VDC.
- 2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Design Reference Application

1. Typical Application Circuit

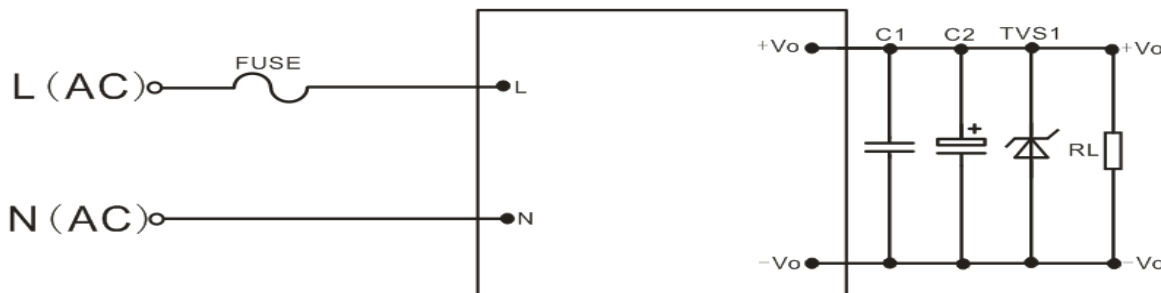


Photo 1: Typical Application Circuit

Note:

Output filter capacitor C2 is electrolytic capacitor, recommend to use high frequency low resistance ones, capacitance and current please refer to the technical specification from each supplier. Capacitor C2 withstand voltage derating is at least 80%. C1 is ceramic capacitor, to filter high frequency noise, recommend 0.1uF/50V/1206. TVS1 tube is a recommend component to protect post-circuit if converter fails. Recommend to connect external FUSE, model:3.15A/250V slow-fusing.

Item No	C2(uF)	TVS1
FA25-220S05H2D4	680	SMBJ9A
FA25-220S09H2D4	330	SMBJ12A
FA25-220S12H2D4	330	SMBJ15A
FA25-220S15H2D4	330	SMBJ20A
FA25-220S24H2D4	220	SMBJ30A
FA25-220S28H2D4	220	SMBJ30A
FA25-220S48H2D4	100	SMBJ58A



2. EMC solution recommended circuit

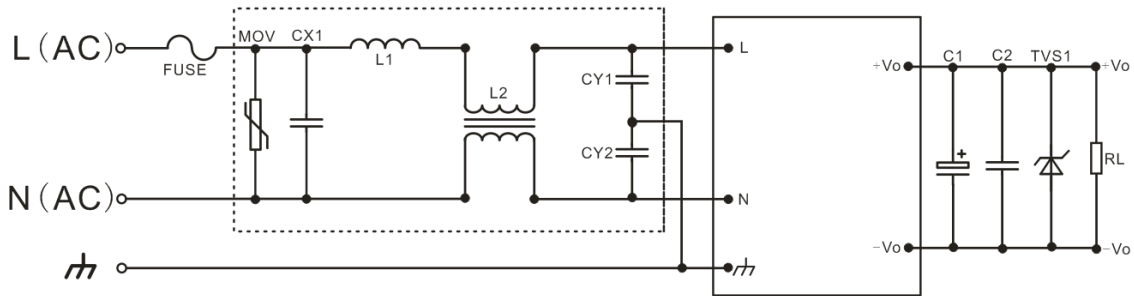


Photo 2: For higher EMC recommended circuit

Model	Name	Recommended Value
FUSE	FUSE	3.15A/250Vac, slow fusing, necessary
MOV	Voltage Dependent Resistor	14D511K
CX1	X Capacitor	0.22uF/275Vac
L1	Differential mode inductor	2.0uH/2.5A I inductor
L2	Common mode inductor	Green ring 15mH/2.5A T12X7X6mm
CY1	Y Capacitor	102M-400Vac
CY2		

Note:

- 1.The product should be used under the specification range, otherwise it will cause permanent damage to it.
- 2.Product's input terminal should connect to fuse;
- 3.If the product operated below the minimum load request, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- 4.If the product worked beyond the load range, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- 5.Unless otherwise specified, data in this datasheet are tested under conditions of **Ta=25°C**, **humidity<75%** when inputting nominal voltage and outputting rated load(pure resistance load);
- 6.All index testing methods in this datasheet are based on our Company's corporate standards.
- 7.The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, please directly contact our technician for specific information;
- 8.We can provide customized product service;
- 9.The product specification may be changed at any time without prior notice.