AC/DC Converter

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

Typical Features

- ◆ Wide Input Voltage Range: 85-305VAC/120-430VDC
- ◆ No load power consumption ≤0.45W
- ◆ Transfer Efficiency: 86%(typ.)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: Short-circuit, Over-current
- ◆ Isolation voltage: 4200Vac
- ◆ Meet IEC62368/UL62368/EN62368 test standard
- ◆ With CE, RoHS Certificate
- ◆ Fully enclosed plastic package, 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

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

Note 1: -T is a wiring package, -TS is a rail package, and the rail width is 35mm.

Note 2: The typical value of output efficiency is based on the product being aged for half an hour at full load.

Note 3: The full load efficiency (%, TYP) in the table fluctuates by ±2%. The full load output efficiency is equal to the total output power divided by the input power of the power module.

Note 4: The ripple and noise test method uses the twisted pair test method. For specific test methods and matching, please refer to the following (Ripple & Noise Test Instructions).

Note 5: Due to limited space, the above is only a partial product list. If you need products outside the list, please contact our sales department.

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	115VAC	-	-	15	
	220VAC	-	-	25	
No Load Power Consumption	Input 115VAC	-	0.10	0.45	W
	Input 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	Vo	-	±1.0	±3.0	%
Line Regulation		Nominal Load	Vo	-	-	±1.0	%
Load Regulation		Nominal input voltage, 20%~100% load	Vo	-	-	±1.0	%
Minimum Load		Single Output		5	-	-	%
Turn-on Delay Time		Input 115Vac (full load)		-	800	-	mS
		Input 220Vac (full load)		-		-	
Power-off Holding 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 100-265VAC		≥130% Io Self-recovery			Hiccup

General Specifications

Items		Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		-	-40	-	+85	℃
		Derating base on Temperature Derating Curve (see product characteristic curve at back)				
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 1min, leakage current≤5mA	4200	-	-	VAC
Insulation Resistance		@DC500V	100	-	-	MΩ
Safety Standard		-	EN62368/ IEC62368			
Vibration		-	10-55Hz,10G,30Min,alongX,Y,Z			
Safety Class		-	CLASS II			
Case Class			UL94 V-0			
MTBF		-	MIL-HDBK-217F@25℃ > 300,000H			

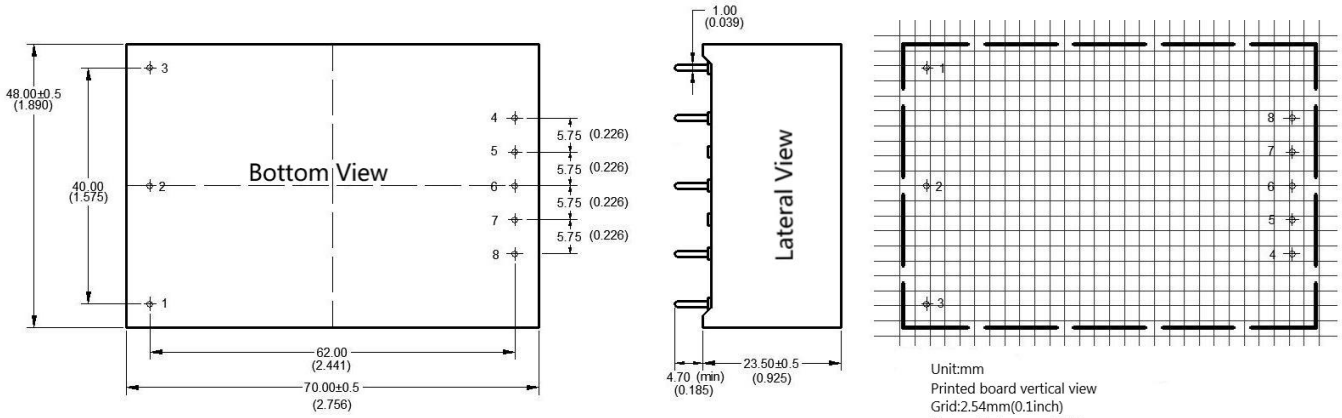
Material Characteristics

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

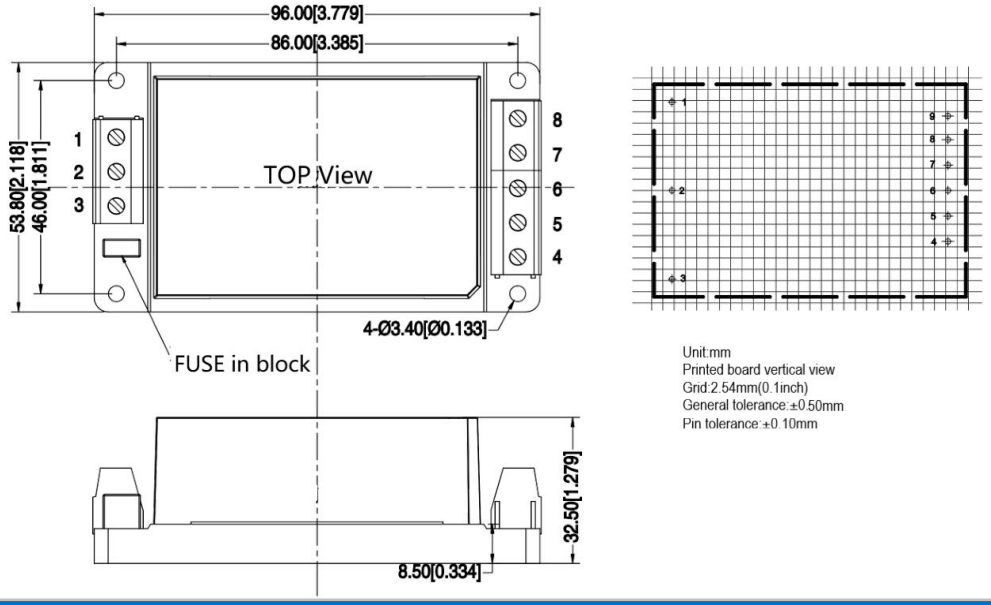
Total Item		Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (Bare board)
		RE	CISPR22/EN55032	CLASS B (Bare board)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (Recommended Circuit 2)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (Recommended Circuit 2)
		ESD	IEC/EN61000-4-2	±8KV / Air ±15KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	line to line ±2KV / line to ground ±4KV Perf.Criteria B (Bare board)
				line to line ±4KV / line to ground ±6KV Perf.Criteria B (Recommended Circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (Bare board)
				±4KV Perf.Criteria B (Recommended Circuit 2)
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

H2D4 Packing Dimension



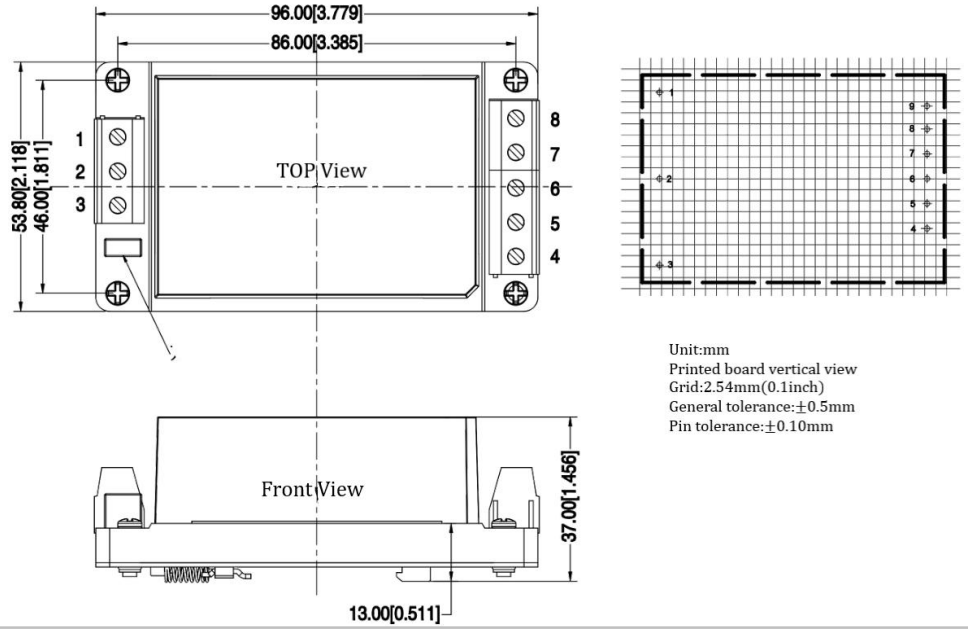
Unit:mm
Printed board vertical view
Grid:2.54mm(0.1inch)
General tolerance:±0.25mm
Pin tolerance:±0.10mm

H2D4-T Packing Dimension



Unit:mm
Printed board vertical view
Grid:2.54mm(0.1inch)
General tolerance:±0.50mm
Pin tolerance:±0.10mm

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 48.0X23.5 mm	2.756X1.890X0.925inch
H2-T	96.0X53.8X32.5 mm	3.779X2.118X1.279inch
H2-TS	96.0X53.8X37.0 mm	3.779X2.118X1.456inch

Pin Definition

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

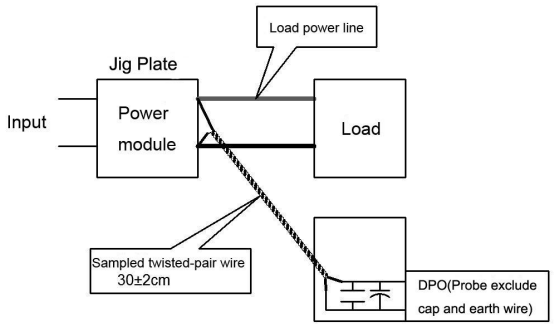
Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

Test Method:

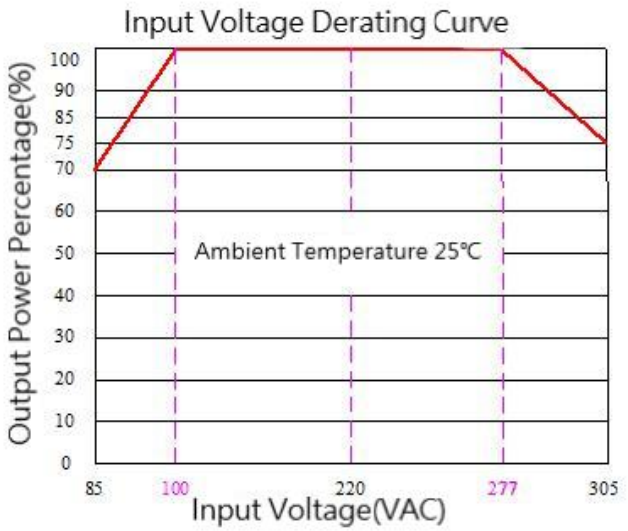
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

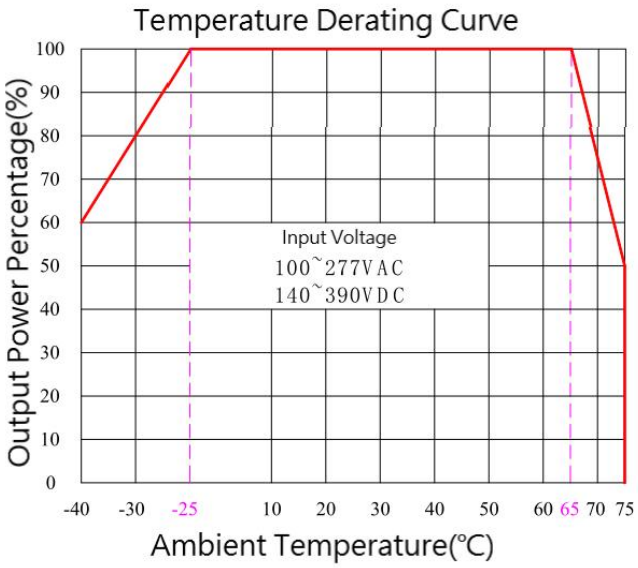
(2) Output Ripple& Noise Test Method:

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





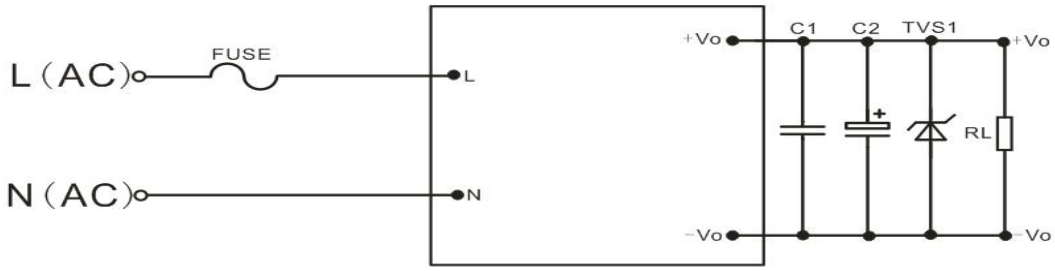
Note

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



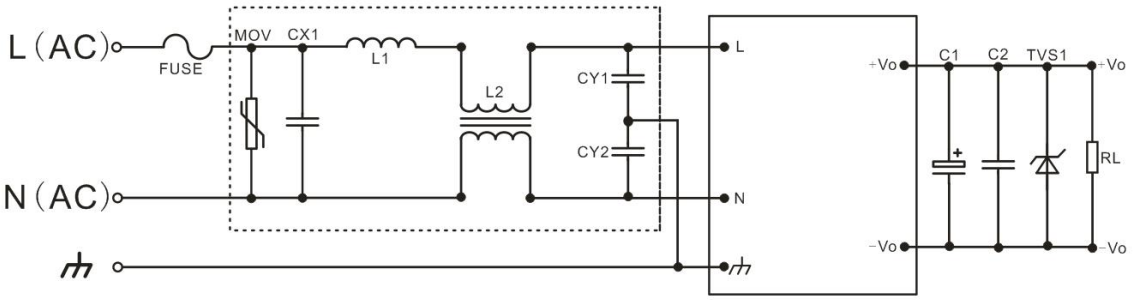
Recommended Circuit 1

Note:

The output filter capacitor C2 is an electrolytic capacitor. It is recommended to use a high-frequency, low-resistance electrolytic capacitor. For the capacity and current flowing through, please refer to the technical specifications provided by each manufacturer. The voltage resistance of C2 capacitor should be reduced to at least 80%. C1 is a ceramic capacitor to remove high-frequency noise. It is recommended to use 0.1uF/50V/1206. TVS1 tube protects the subsequent circuit when the module is abnormal. It is recommended to use it. It is recommended to connect an external FUSE fuse, model: 3.15A/250V slow break.

Item No	C2(uF)	TVS1
FA25-220S05H2D4	680	SMBJ9A
FA25-220S09H2D4	330	SMBJ12A
FA25-220S12H2D4	330	SMBJ15A
FA25-220S15H2D4	330	SMBJ20A
FA25-220S18H2D4	330	SMBJ30A
FA25-220S24H2D4	220	SMBJ30A
FA25-220S28H2D4	220	SMBJ30A
FA25-220S29H2D4	220	SMBJ33A
FA25-220S48H2D4	100	SMBJ58A

2. EMC solution recommended circuit



Recommended Circuit 2

Model	Name	Recommended Value
FUSE	FUSE	3.15A/250Vac, slow fusing, necessary
MOV	Voltage Dependent Resistor	14D561K
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℃**, **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.

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