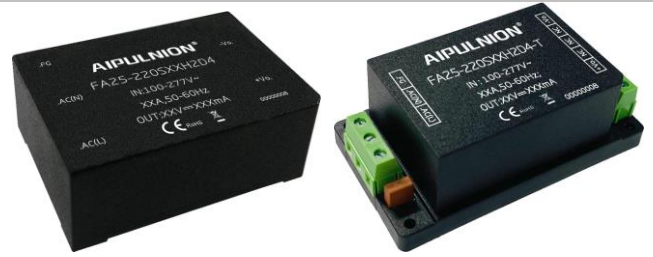


Typical Features

- ◆ 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: 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

| 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) | | | |
| 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 |
| CE RoHS | 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: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.

Note 3: The fluctuation range of full load efficiency(% ,TYP) is ±2%, full load output efficiency= total output power/module's input power.

Note 4: 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 | 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 | - | ±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) | - | 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% | -5.0 | - | +5.0 | % |
| | Recovery time | 50%~75%~50% | -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% | - | %/°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 | I/P-O/P | test 1min, leakage current≤5mA | 3800 | - | - | VAC |
| Insulation Resistance | | | | | | |
| 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°C > 300,000H | | | |

Material Characteristics

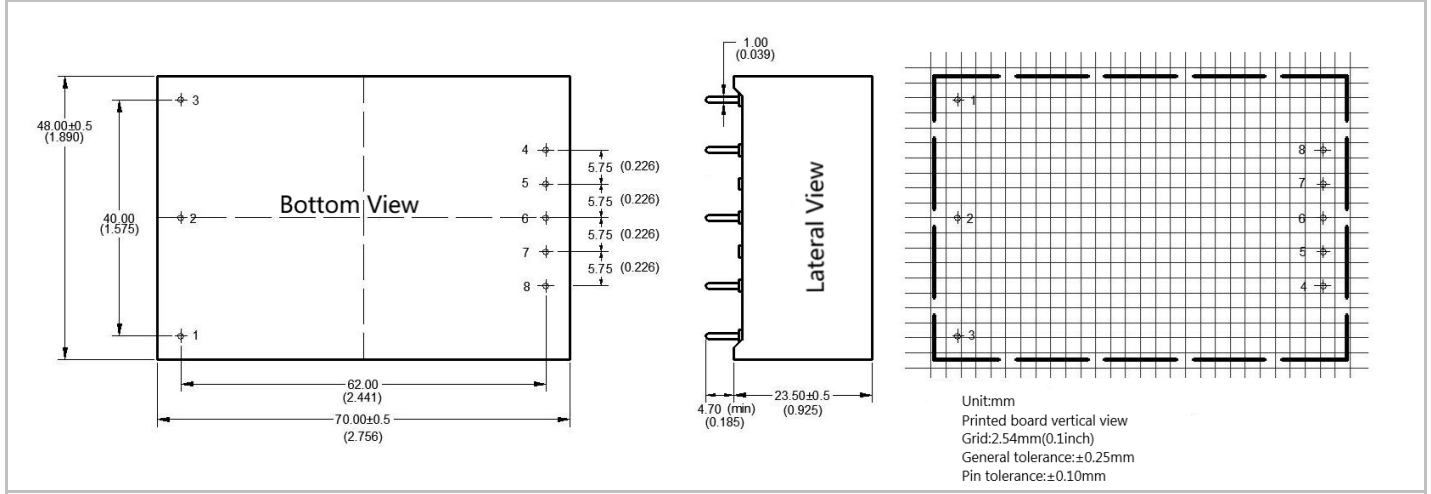
| | | | |
|-------------------|--------------------|---|--|
| Case Material | | Black flame-retardant heat-resistant plastic (UL94 V-0) | |
| Packing Dimension | Horizontal package | 70.0X48.0X23.5 mm | |
| Product Weight | | 128g(TYP) | |
| Cooling Method | | Natural air cooling | |

EMC Characteristics

| Total Item | Sub Item | Test Standard | Class | |
|---|----------|---------------|--------------------------------------|---|
| EMC | EMI | CE | CISPR22/EN55032 CLASS B (Bare board) | |
| | | RE | CISPR22/EN55032 CLASS B (Bare board) | |
| | EMS | RS | IEC/EN61000-4-3 | 10V/m Perf.Criteria B (see recommended circuit Photo 2) |
| | | CS | IEC/EN61000-4-6 | 3Vr.m.s Perf.Criteria B (see recommended circuit Photo 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) |
| | | EFT | IEC/EN61000-4-4 | line to line ±4KV / line to ground ±6KV |
| Perf.Criteria B (see recommended circuit Photo 2) | | | | |
| | | | ±2KV Perf.Criteria B (Bare board) | |

| | | | |
|--|--------------------------------|------------------|--|
| | | | ±4KV Perf.Criteria B (see recommended circuit Photo 2) |
| | Voltage dips and interruptions | IEC/EN61000-4-11 | 0%~70% Perf.Criteria B |

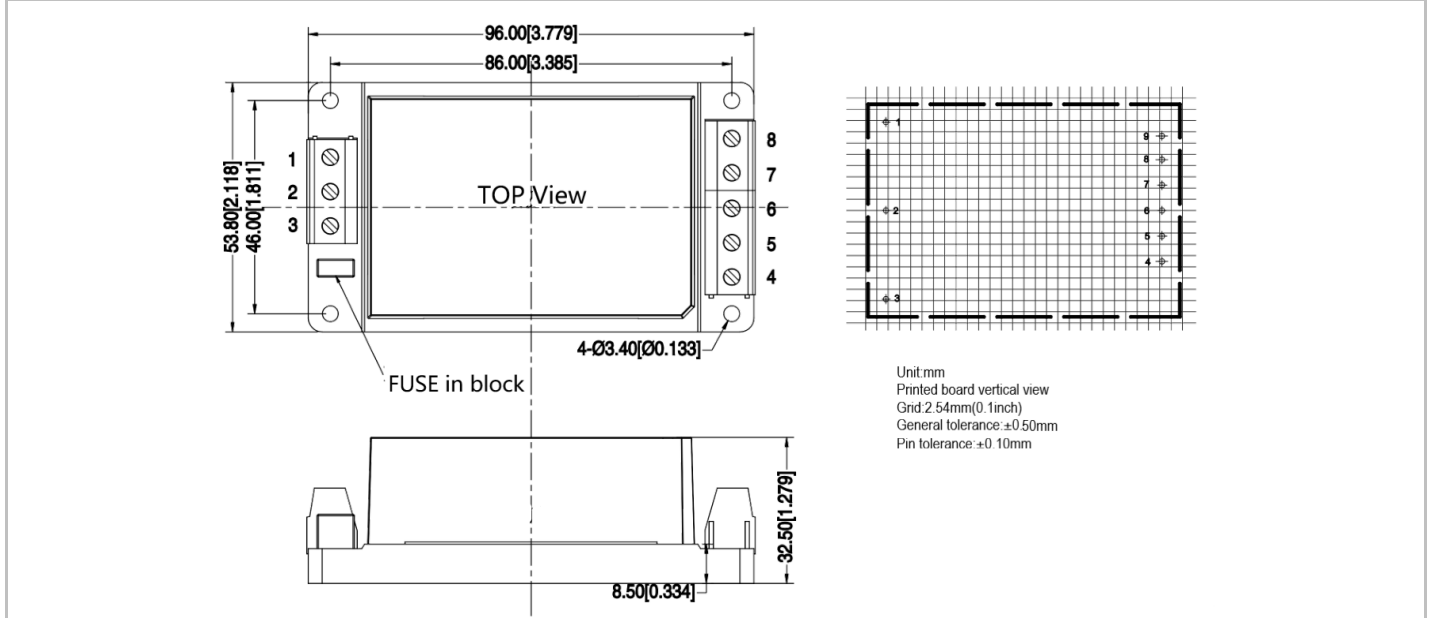
H2D4 Packing Dimension



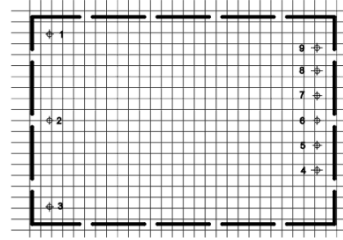
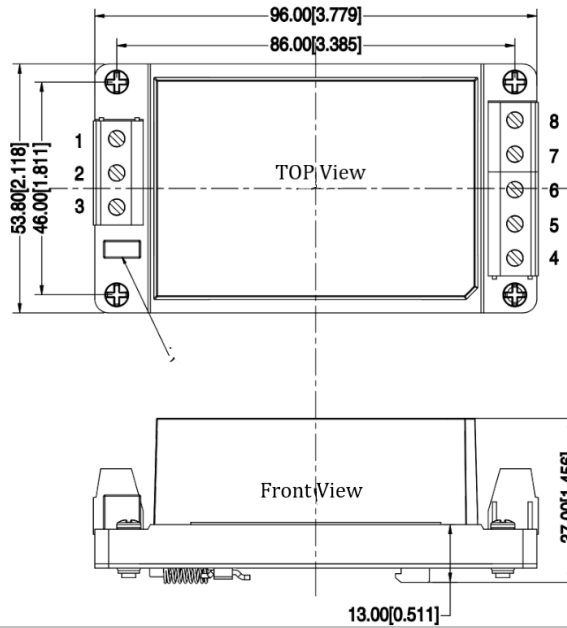
Pin Definition

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

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 48.0X23.5 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 |

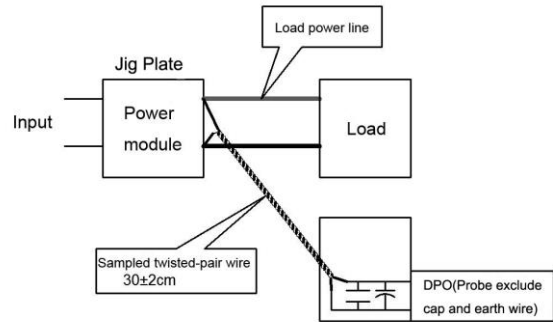
Ripple & Noise Test: (Twisted Pair Method 20MHz bandwidth)

Test Method:

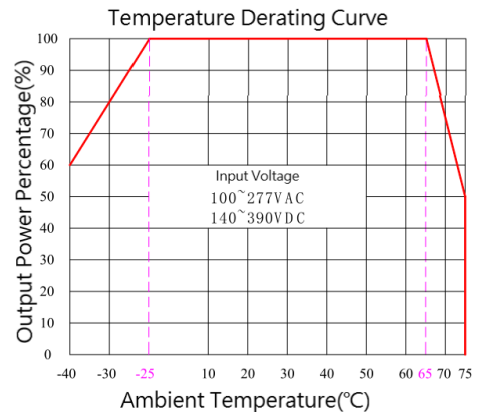
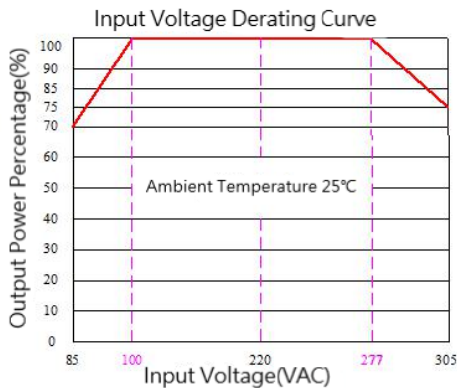
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(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

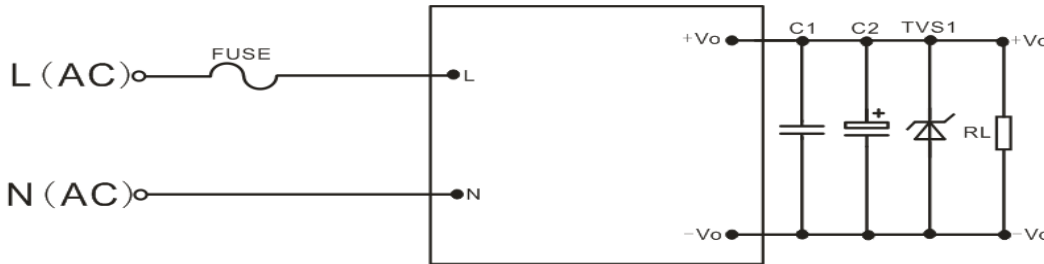


Photo 1: Typical Application Circuit

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 |
| FA25-220S18H2D4 | 330 | SMBJ30A |
| FA25-220S24H2D4 | 220 | SMBJ30A |
| FA25-220S28H2D4 | 220 | SMBJ30A |
| FA25-220S48H2D4 | 100 | SMBJ58A |

2. EMC solution recommended circuit

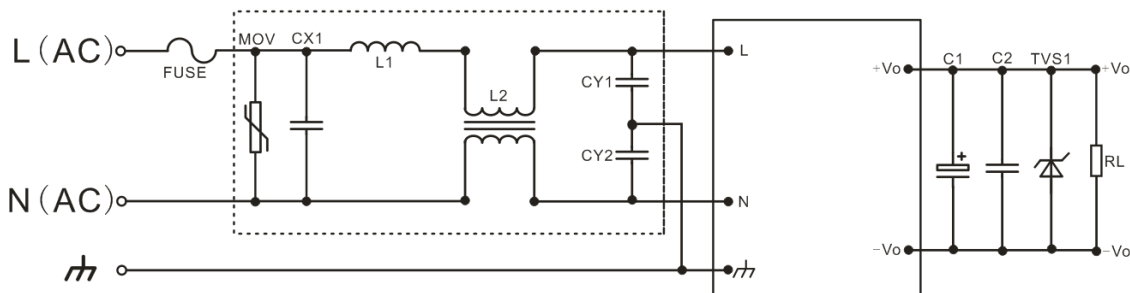


Photo 2: For higher EMC recommended circuit



| Model | Name | Recommended Value |
|-------|----------------------------|---|
| FUSE | FUSE | 3.15A/250Vac, slow fusing, necessary |
| MOV | Voltage Dependent Resistor | 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°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.