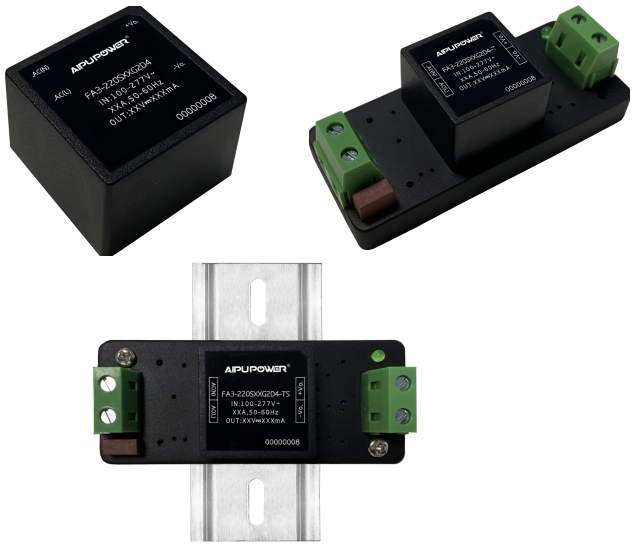
## Typical Features

- ◆ Wide input voltage range 85-305VAC/100-430VDC
- ◆ No load power consumption ≤ 0.25W @220VAC
- ◆ Efficiency 75%(TYP.)
- ◆ Operating temperature from -40°C to +85°C
- ◆ Switching Frequency 65KHz
- ◆ Short circuit & over current protections
- ◆ Isolation voltage 4000VAC
- ◆ Altitude during operation 4000m Max.
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ PCB DIP mounting



## Application Field

***FA3-220SXXG2D4(-T)(-TS) 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, smart home devices, etc. The additional circuit for EMC is recommended in this data sheet for the application with high EMC requirement.*

## Typical Product List

| Certificate | Part No. | Output Specifications | | | Max. Capacitive Load (220Vac) | Ripple & Noise 20MHz (Max) | Efficiency@ Full Load, 220Vac (Typical) |
|---|---|---|---|---|---|---|---|
| | | Power | Voltage | Current | | | |
| | | (W) | Vo (V) | Io (mA) | uF | mVp-p | % |
| - | FA3-220S3V3G2D4 | 3 | 3.3 | 900 | 2000 | 100 | 68 |
| | FA3-220S05G2D4 | 3 | 5 | 600 | 2000 | 100 | 70 |
| | FA3-220S12G2D4 | 3 | 12 | 250 | 1000 | 120 | 75 |
| | FA3-220S12V5G2D4 | 3 | 12.5 | 240 | 1000 | 120 | 75 |
| | FA3-220S15G2D4 | 3 | 15 | 200 | 800 | 120 | 75 |
| | FA3-220S24G2D4 | 3 | 24 | 125 | 400 | 150 | 76 |

Note 1 - Please contact Aipu sales for other output voltages requirements in this series but not in this table.

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 - The suffix -T indicates a kind of chassis package with terminals, -TS indicates a kind of package of DIN Rail.

## 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 | 115VAC | - | - | 0.12 | A |
| | 220VAC | - | - | 0.08 | |
| Surge Current | 115VAC | - | - | 15 | |
| | 220VAC | - | - | 20 | |
| No Load Power Consumption | Input 115VAC | - | - | 0.25 | W |
| | Input 220VAC | - | - | | |
| Leakage Current | - | 0.5mA TYP/230VAC/50Hz | | | |
| Recommended External Fuse | - | 2A/250VAC Time-delay fuse | | | |
| Hot Plug | - | Unavailable | | | |
| Remote Control | - | Unavailable | | | |

## Output Specifications

| Item | | Operating Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Voltage Accuracy | | Full input voltage range, any load | 3.3V output | - | ±3.0 | ±5.0 | % |
| | | | Others | - | ±2.0 | ±3.0 | % |
| Line Regulation | | Nominal load | | - | - | ±0.5 | % |
| Load Regulation | | Nominal input voltage, 20%~100% load | | - | - | ±1.0 | % |
| Minimum Load | | Single Output | | 0 | - | - | % |
| Turn-on Delay Time | | Nominal input voltage (full load) | | - | 50 | - | mS |
| Power-off Hold up Time | | Input 115VAC (full load) | | - | 50 | - | mS |
| | | Input 220VAC (full load) | | - | 100 | - | |
| Dynamic Response | Overshoot range | 25%~50%~25%<br>50%~75%~50% | | -5.0 | - | +5.0 | % |
| | Recovery time | | | - | 5.0 | - | mS |
| Output Overshoot | | Full input voltage range | | ≤10%Vo | | | % |
| Short circuit Protection | | | | Continuous, self-recovery | | | Hiccup |
| Temperature Drift | | - | | - | ±0.03% | - | %/℃ |
| Over Current Protection | | Input 220VAC | | ≥130% Io, self-recovery | | | Hiccup |
| Ripple & Noise | | Full input voltage range | | - | 60 | 150 | mV |
| | | The Ripple & Noise are tested by the twisted pair method according to the following Instructions. | | | | | |

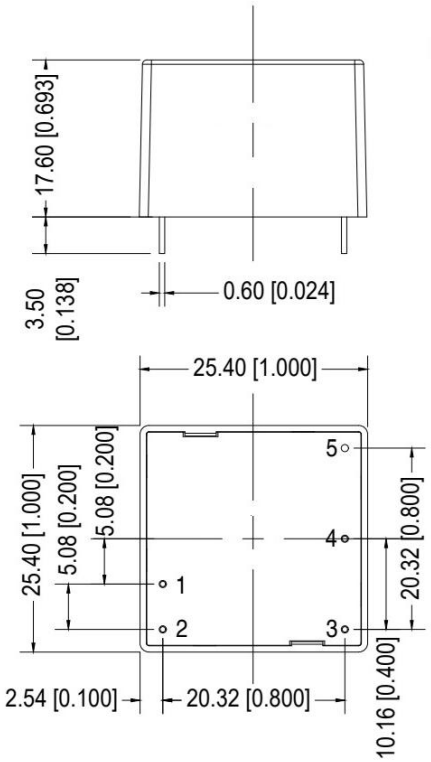
## General Specifications

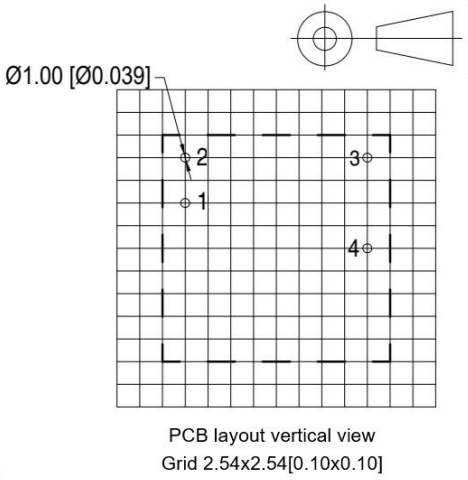
| Item | Operating Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|
| Switching Frequency | - | - | 65 | - | KHz |
| Operating Temperature | Refer to the Temperature Derating Graph | -40 | - | +85 | ℃ |
| Storage Temperature | - | -40 | - | +105 | |
| Soldering Temperature | Wave soldering | 260±4℃, time 5-10S | | | |
| | Manual soldering | 360±8℃, time 4-7S | | | |
| Relative Humidity | - | 10 | - | 90 | %RH |
| Isolation Voltage | I/P-O/P, Test 1min, leakage current ≤5mA | 4000 | - | - | VAC |
| Insulation Resistance | I/P-O/P, @ DC500V | 100 | - | - | MΩ |
| Safety Standard | - | EN62368, IEC62368 | | | |
| Vibration | - | 10-55Hz, 10G, 30Min, along X, Y, Z | | | |
| Safety Standard | - | CLASS Ⅱ | | | |
| Case Flame Class | | UL94 V-0 | | | |
| MTBF | - | MIL-HDBK-217F@25℃＞300,000H | | | |
| Unit Weight | Part No. | Weight (Typ.) | | | |
| | FA3-220SXXG2D4 | 20g | | | |
| | FA3-220SXXG2D4-T | 45g | | | |
| | FA3-220SXXG2D4-TS | 65g | | | |

## EMC Performance

| Total Item | | Sub Item | Test Standard | Performance/Class |
|---|---|---|---|---|
| EMC | EMI | CE | CISPR22/EN55032 | CLASS B (with the Recommended Circuit 1) |
| | | RE | CISPR22/EN55032 | CLASS B (with the Recommended Circuit 1) |
| | EMS | RS | IEC/EN61000-4-3 | 10V/m Perf.Criteria B (with the Recommended Circuit 1) |
| | | CS | IEC/EN61000-4-6 | 3Vr.m.s Perf.Criteria B (with the Recommended Circuit 1) |
| | | ESD | IEC/EN61000-4-2 | Contact ±6KV / Air ±8KV Perf.Criteria B |
| | | Surge | IEC/EN61000-4-5 | Line to line ±2KV / line to ground ±4KV<br>Perf.Criteria B (with the Recommended Circuit 1) |
| | | EFT | IEC/EN61000-4-4 | ±2KV Perf.Criteria B |
| | | Voltage dips and variations | IEC/EN61000-4-11 | 0%~70% Perf.Criteria B |

## FA3-220SXXG2D4 Dimensions



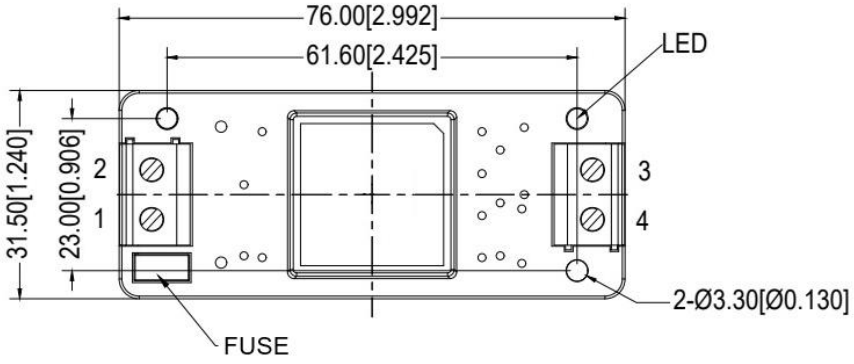



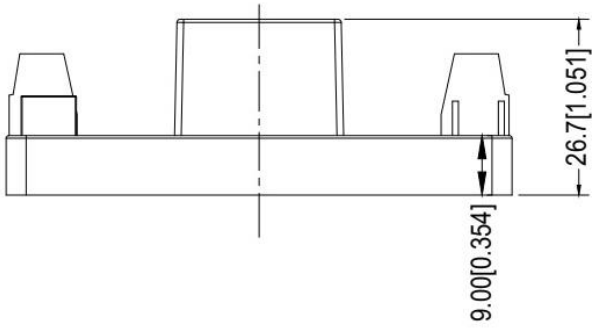

PCB layout vertical view
Grid 2.54x2.54[0.10x0.10]

| Pin No. | Functions |
|---|---|
| 1 | AC(L) |
| 2 | AC(N) |
| 3 | +Vout |
| 4 | -Vout |
| 5 | No Pin |

Unit: mm[inch]
Pin diameter tolerance ±0.10[±0.004]
General tolerance ±0.50[±0.020]

## FA3-220SXXG2D4-T Dimensions

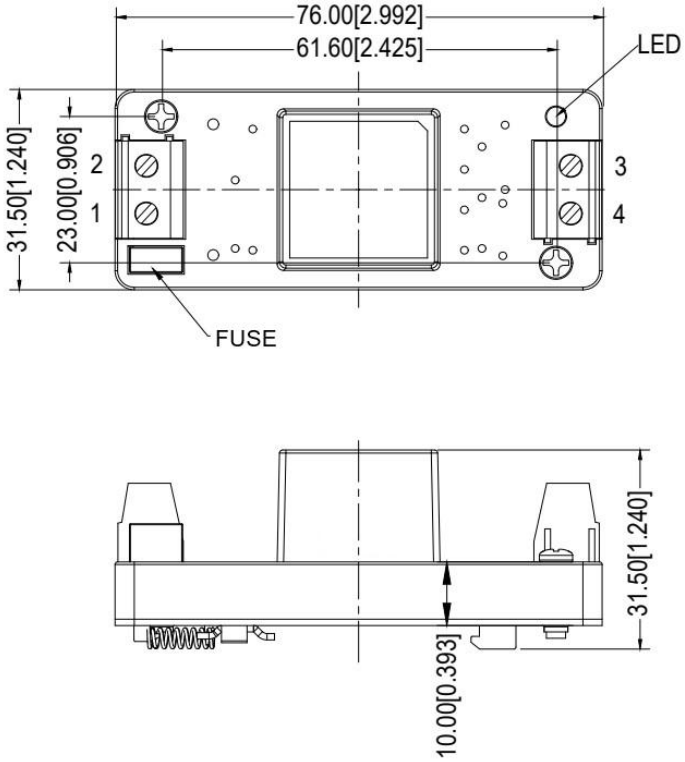



| Terminal No. | Functions |
|---|---|
| 1 | AC(L) |
| 2 | AC(N) |
| 3 | +Vout |
| 4 | -Vout |

Note:
Unit: mm[inch]
Lead Wire Size: 24 -12AWG
Screwing Torque: 0.4N.m Max
General tolerance ±1.00[±0.039]

## FA3-220SXXG2D4-TS Dimensions




| Terminal No. | Functions |
|---|---|
| 1 | AC(L) |
| 2 | AC(N) |
| 3 | +Vout |
| 4 | -Vout |

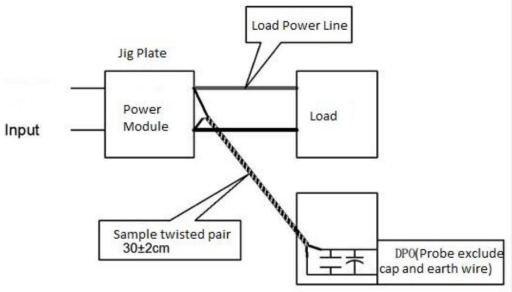
Note:
Unit: mm[inch]
Lead Wire Size: 24 -12AWG
Screwing Torque: 0.4N.m Max
General tolerance ±1.00[±0.039]

| Packaging Code | Dimensions L x W x H | |
|---|---|---|
| - | 25.40X25.40X17.60 mm | 1.000X1.000X0.693 inch |
| -T | 76.00X31.50X26.70 mm | 2.992X1.240X1.051 inch |
| -TS | 76.00X31.50X31.50 mm | 2.992X1.240X1.240 inch |

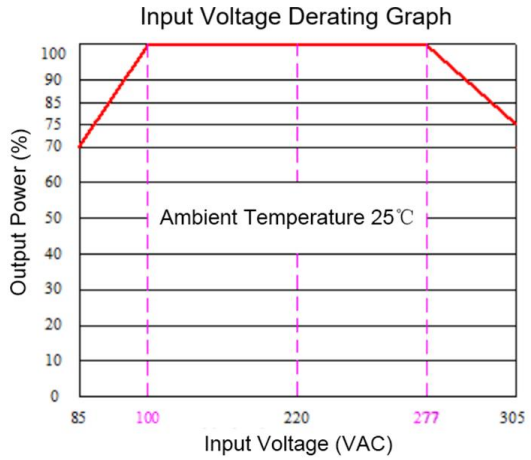
## Ripple & Noise Test Instruction (Twisted Pair Method, 20MHZ bandwidth)

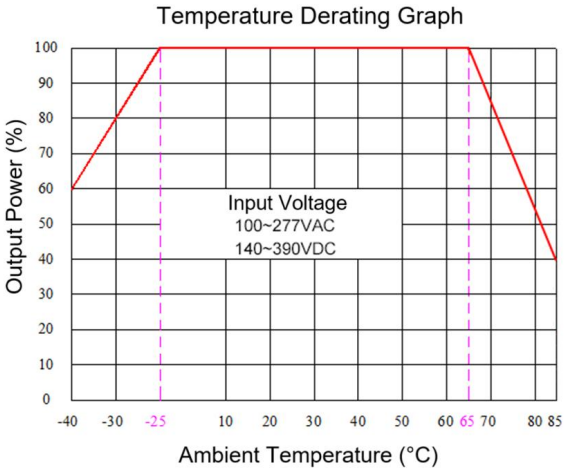
1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.

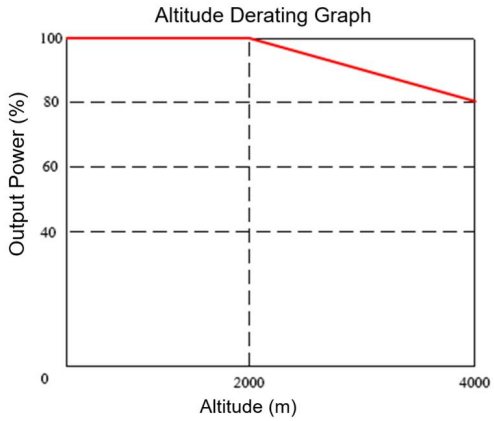
2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be started after input power on.



## Product Characteristic Graphs



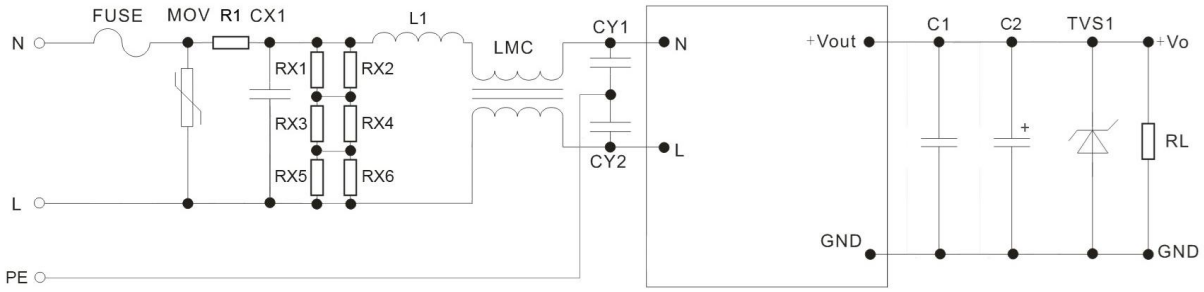




Note 1 - The output power should be derated based on the input voltage derating graph at 85~100VAC/277~305VAC& 120~140VDC/390~430VDC.

Note 2 - This product should operate at a natural air condition, please contact us if it need be used at a closed space.

## Recommended Typical EMC Circuit




**Circuit 1**

| Part No. | FUSE (*) | MOV | R1(*) | CX1 | RX1,RX2, RX3,RX4, RX5,RX6 | L1 | LMC | CY1 CY2 | C1 | C2 | TVS1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FA5-220S3V3G2D4 | 2A/250V (Time-delay fuse) | 14D561K/4500A | 33Ω/3W (Wire-wound resistor) | X2/334K/310VAC | 1206/1.5MΩ | 1.2mH/0.3A | 20mH | Y1/102M/400VAC | 1uF/50V | 100uF/16V | SMBJ7.0A |
| FA5-220S05G2D4 | | | | | | | | | | | |
| FA5-220S12G2D4 | | | | | | | | | | 68uF/16V | SMBJ20A |
| FA5-220S12V5G2D4 | | | | | | | | | | | |
| FA5-220S15G2D4 | | | | | | | | | | | |
| FA5-220S24G2D4 | | | | | | | | | | 47uF/35V | SMBJ30A |

**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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