

| Typical Features | |
|------------------|--|
| ◆ | Wide input voltage range: 85-305VAC/120-430VDC |
| ◆ | No load power consumption $\leq 0.3W$ |
| ◆ | Transfer Efficiency 83%(TYP.) |
| ◆ | Switching Frequency: 65KHz |
| ◆ | Protections: short circuit, over current |
| ◆ | Isolation voltage: 4000Vac |
| ◆ | Meet IEC62368/IEC61558-2-16/IEC61558-1/ UL62368/EN62368 test standard |
| ◆ | Pass TUV/CE certificate |
| ◆ | PCB Mounting |



Application Field

FA10-220SXXG2N4(-T)(-TS) Series----- is a small size, high efficiency module power supply provided by Aipu to customers. This series of power supplies has the advantages of global input voltage range, AC/DC dual use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, high safety isolation, and good EMC performance. EMC and safety specifications meet the international EN55032 and IEC/EN61000 standards. This series of products are widely used in many fields such as power, industry, instrumentation and smart home. When the product is used in an environment with relatively harsh electromagnetic compatibility, please refer to the application circuit provided by our company.

Typical Product List

| Certificate | Part No. | Output Specifications | | | Max. Capacitive Load | Ripple& Noise 20MHz (Max) | Efficiency@ Full Load, 220Vac (Typical) |
|-------------|-------------------|-----------------------|---------|---------|----------------------|---------------------------|---|
| | | Power | Voltage | Current | | | |
| | | (W) | Vo(V) | Io(m A) | | | |
| CE/CB | FA10-220S3V3G2N4 | 8.6 | 3.3 | 2600 | 5000 | 100 | 73 |
| CE/CB | FA10-220S05G2N4 | 10 | 5 | 2000 | 5000 | 100 | 76 |
| CE/CB | FA10-220S12G2N4 | 10 | 12 | 833 | 3000 | 120 | 82 |
| CE/CB | FA10-220S12V5G2N4 | 10 | 12.5 | 800 | 3000 | 120 | 82 |
| CE/CB | FA10-220S15G2N4 | 10 | 15 | 667 | 3000 | 120 | 82 |
| CE/CB | FA10-220S24G2N4 | 10 | 24 | 416 | 2000 | 150 | 83 |

Note 1: "*" represents a model under development;
 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 $\pm 2\%$, and the full load efficiency is the total output power divided by the input power of the module;
 Note 4: Due to limited space, the above is only a partial list of products. If you need products outside the list, please contact our sales department.
 Note 5: -T is a wiring package, and -TS is a guide rail package

| Input Specification | | | | | | | |
|---------------------------------|---|------------------------|---------------------------|--------|------|--------|---|
| 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 | 115VAC | - | - | 0.25 | A | | |
| | 220VAC | - | - | 0.15 | | | |
| Surge Current | 115VAC | - | - | 15 | | | |
| | 220VAC | - | - | 30 | | | |
| Leakage Current | - | 0.25mA TYP/230VAC/50Hz | | | | | |
| Recommended External Input Fuse | - | 2A/300VAC slow fusing | | | | | |
| Hot Plug | - | Unavailable | | | | | |
| Remote Control Terminal | - | Unavailable | | | | | |
| Output Specification | | | | | | | |
| Item | Operating Condition | | Min | Typ. | Max | Unit | |
| Voltage Accuracy | Full input voltage range, any load | | Vo | - | ±2.0 | ±3.0 | % |
| Line Regulation | Nominal load | | Vo | - | ±0.5 | ±1.0 | % |
| Load Regulation | Nominal input voltage, 20%~100% load | | Vo | - | ±1.0 | ±2.0 | % |
| No Load Power Consumption | Input 115VAC | | - | - | 0.3 | W | |
| | Input 220VAC | | - | - | | | |
| Minimum Load | Single Output | | 0 | - | - | % | |
| Start up Delay Time | Nominal input voltage (full load) | | - | 1000 | - | mS | |
| Power-off Holding Time | Input 115VAC (full load) | | - | 50 | - | mS | |
| | Input 220VAC (full load) | | - | 80 | | | |
| Dynamic Response | Overshoot range | 25%~50%~25% | -5.0 | - | +5.0 | % | |
| | Recovery time | 50%~75%~50% | -5.0 | - | +5.0 | mS | |
| Output Overshoot | Full input voltage range | | ≤10%Vo | | | % | |
| Short circuit Protection | | | Continuous, self-recovery | | | Hiccup | |
| Temperature Drift | - | | - | ±0.03% | - | %/°C | |
| Over Current Protection | Input 220VAC | | ≥120% Io, self-recovery | | | Hiccup | |
| Ripple & Noise | Full input voltage range | | - | 80 | 150 | mV | |
| | Ripple and noise is tested by Twisted Pair method, for details please check at back of datasheet. | | | | | | |

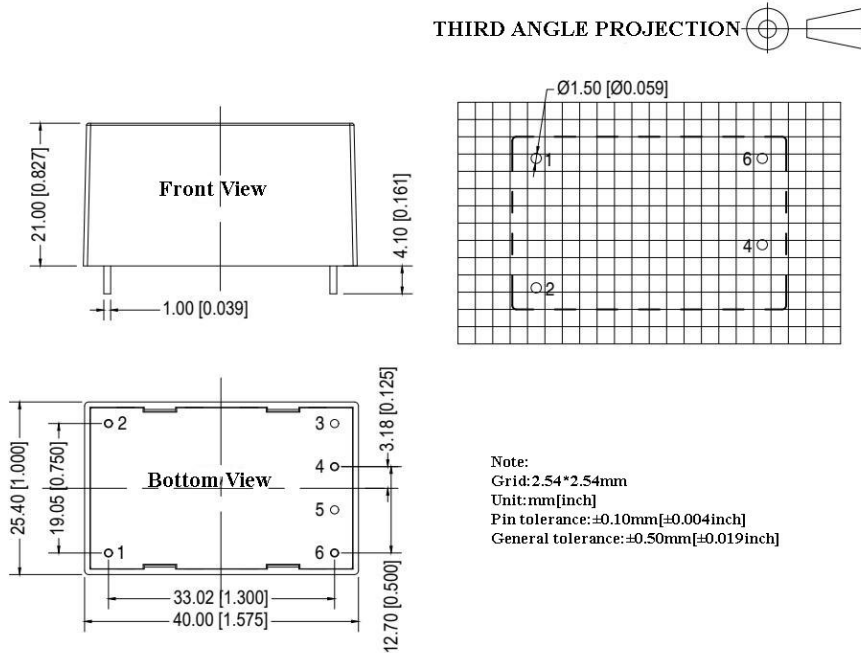
General Specification

| Item | | Operating Condition | Min | Typ. | Max | Unit |
|-----------------------|--------------|--------------------------------|-----------------------------------|------|------|------|
| Switching Frequency | | - | - | 65 | - | KHz |
| Operating Temperature | | - | -40 | - | +105 | °C |
| Storage Temperature | | - | -40 | - | +110 | |
| Soldering Temperature | | Wave soldering | 260±4°C, time 5-10S | | | |
| | | Manual soldering | 360±8°C, time 4-7S | | | |
| Relative Humidity | | - | 10 | - | 90 | %RH |
| Isolation Voltage | Input-Output | Test 1min, leakage current≤5mA | 4000 | - | - | VAC |
| Insulation Resistance | Input-Output | @ DC500V | 100 | - | - | MΩ |
| Safety Standard | | - | EN62368、EN60950、IEC60950、IEC61558 | | | |
| Vibration | | - | 10-55Hz,10G,30Min,along X,Y,Z | | | |
| Safety Standard | | - | CLASS II | | | |
| MTBF | | - | MIL-HDBK-217F@25°C > 300,000H | | | |

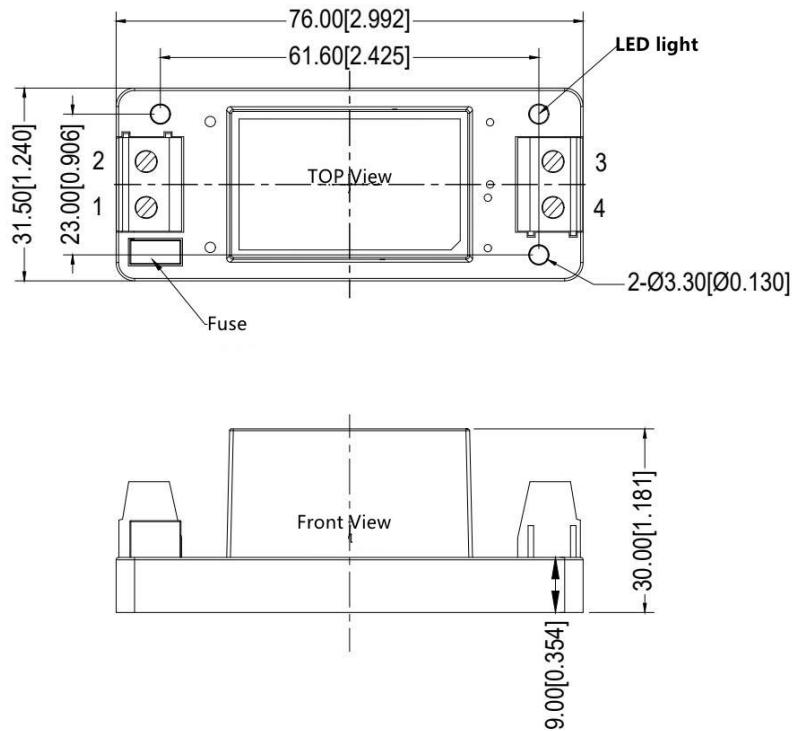
EMC Characteristics

| Total Item | Sub Item | Test Standard | Class |
|------------|----------|--------------------------------|--|
| EMC | EMI | CE | CISPR32/EN55032 CLASS B (Recommended Circuit 2) |
| | | RE | CISPR32/EN55032 CLASS B (Recommended Circuit 2) |
| | 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 Contact ±6KV / Air ±8KV Perf.Criteria B |
| | | Surge | IEC/EN61000-4-5 line to line ±1KV Perf. Criteria B line to line ±2KV / line to ground ±4KV Perf.Criteria A (Recommended Circuit 2) |
| | | EFT | IEC/EN61000-4-4 ±2KV Perf.Criteria B ±4KV Perf.Criteria A (Recommended Circuit 2) |
| | | Voltage dips and interruptions | IEC/EN61000-4-11 0%~70% Perf.Criteria B |

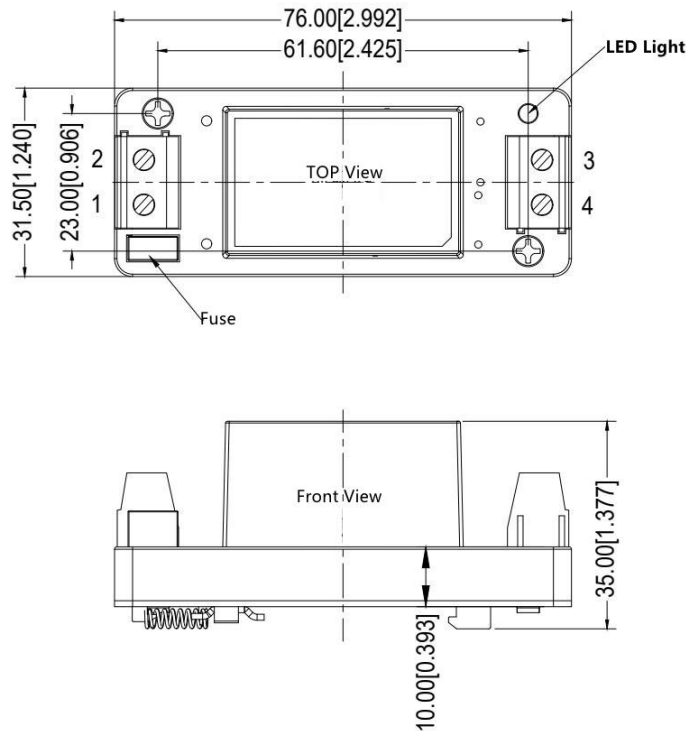
Dimension



Dimension(-T)



Dimension(-TS)



| Packing Code | L x W x H | |
|--------------|--------------------------|----------------------------|
| - | 40.00 x 25.40 x 21.00 mm | 1.575 x 1.000 x 0.827 inch |
| -T | 76.00 x 31.50 x 30.00 mm | 2.992 x 1.240 x 1.181 inch |
| -TS | 76.00 x 31.50 x 35.00 mm | 2.992 x 1.240 x 1.377 inch |

Pin Specification

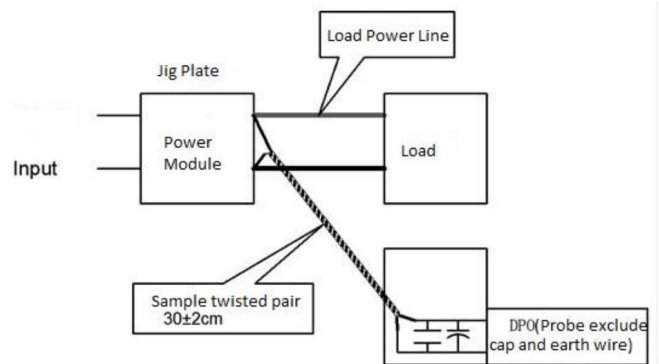
| Pin | 1 | 2 | 3 | 4 | 5 | 6 |
|------------|-------|-------|-----|-----|----|-----|
| Single (S) | AC(L) | AC(N) | NP | +Vo | NP | -Vo |
| -T/ -TS | AC(L) | AC(N) | -Vo | +Vo | | |

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

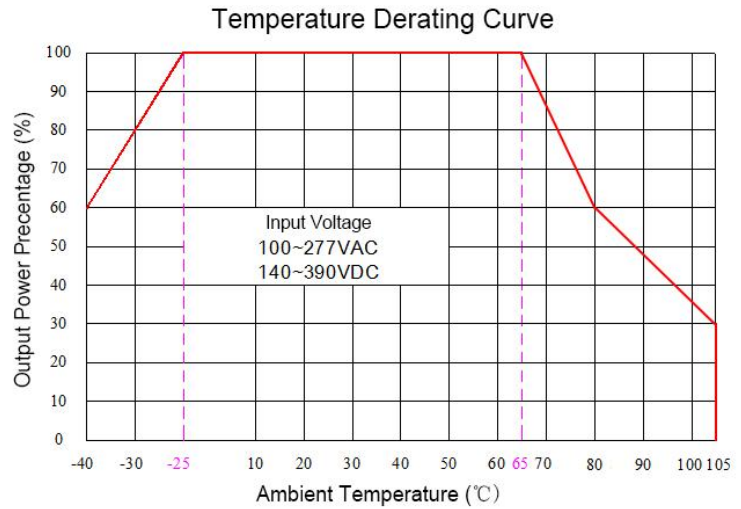
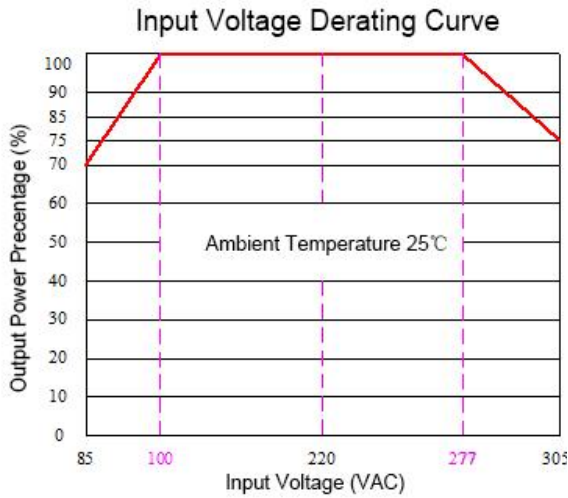
Test Method:

(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) 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

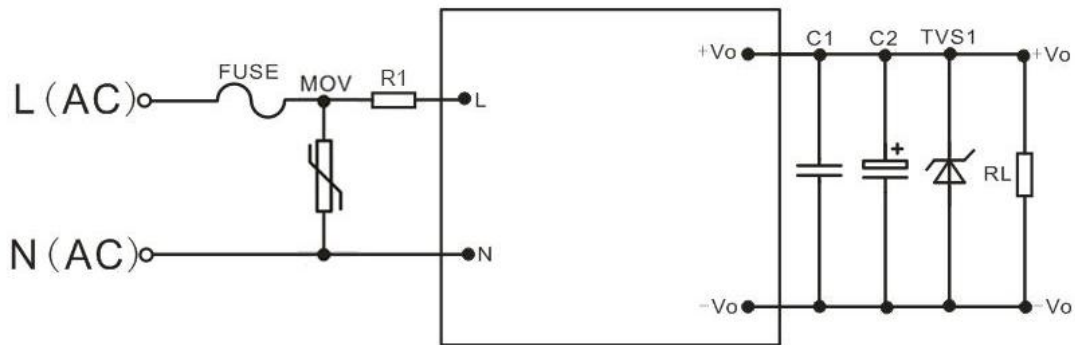


Note 1: Input Voltage should be derated based on Input voltage derating curve when it is 85~100VAC/277~305VAC/120~140VDC/ 390~430VDC.

Note 2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Typical Application Circuit and EMC Recommended Circuit

1. Typical Application Circuit



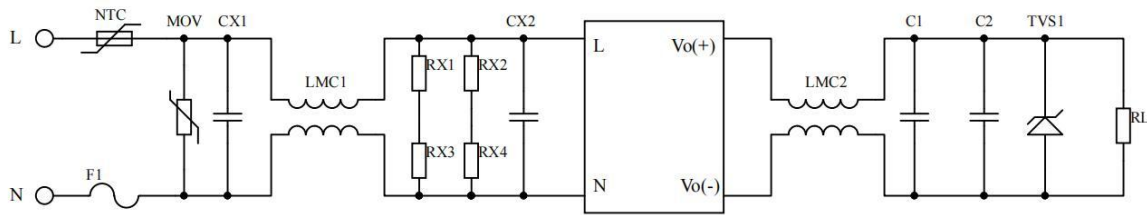
Recommended Circuit 1

| Part Number | FUSE (necessary) | MOV | R1 | C1 | C2 | TVS Tube |
|------------------|---------------------|---------|-----------------------------|---------|-----------|----------|
| FA10-220S3V3G2N4 | 2.0A/ 300V | 14D561K | 6.8 Ω/3W (winding resistor) | 1uF/50V | 220uF/16V | SMBJ7.0A |
| FA10-220S05G2N4 | | | | | | SMBJ20A |
| FA10-220S12G2N4 | | | | | 100uF/25V | SMBJ20A |
| FA10-220S15G2N4 | | | | | 100uF/35V | SMBJ30A |
| FA10-220S24G2N4 | | | | | 100uF/35V | SMBJ30A |

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 capacitor withstand voltage should be derated to at least 80%.
- C1 is a ceramic capacitor to remove high-frequency noise.
- The TVS tube protects the subsequent circuit when the module is abnormal. It is recommended to use it.

2. EMC recommended circuit (Used Under high EMC requirement)



Recommended Circuit 2

Note 1:

- 1) FUSE is a fuse, and it is recommended to use 2A~250VAC slow-break, square type;
- 2) MOV is a varistor, and the recommended model is 14D561K;
- 3) NTC is a thermistor, and the recommended model is 10D-11, which is used to protect the module from damage during lightning surges;
- 4) LMC1, LCM2 are common mode inductors, and the recommended inductance of LCM1 is 30mH, and the recommended inductance of LCM2 is 40uH;
- 5) CX1 is an X capacitor, and the recommended model is 0.22uF/275Vac; CX2 is an X capacitor, and the recommended model is 0.1uF/275VAC;
- 6) RX1, RX2, RX3, RX4 are chip resistors, and the recommended model is 1206, 1MΩ;
- 7) C1 selects a high-frequency low-impedance electrolytic capacitor with a capacitance value smaller than the capacitive load, and the withstand voltage value is more than 1.5 times the output voltage;
- 8) C2 is a 0.1uF ceramic chip capacitor with a withstand voltage of more than 1.5 times the output voltage;
- 9) TVS1 is a TVS tube; 5V output is recommended to use: SMBJ7.0A, 9V output is recommended to use: SMBJ12.0A, 12V output is recommended to use: SMBJ20A, 15V output is recommended to use: SMBJ20.0A, 24V output is recommended to use: SMBJ30.0A, 48V output is recommended to use: SMBJ64A.

Note 2:

1. The product should be used within the specification range, or it will cause permanent damage to it;
2. The input terminal should connect to fuse;
3. If the product is worked under the minimum requested load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
4. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
5. Unless otherwise specified, parameters in this datasheet were measured under the conditions of **Ta=25°C**, **humidity<75%** with nominal input voltage and rated output 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 product customization service,
9. Specifications are subject to change without prior notice, please follow up with our website for newest manual.

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