

Typical Features

- ◆ Wide input voltage range(90-310VAC) 127-438VDC
- ◆ Transfer efficiency 83%(Typ.)
- ◆ Switching Frequency: 65KHz (Typ.)
- ◆ Over current, short circuit Protection
- ◆ Isolation:3100VAC
- ◆ PCB mounting
- ◆ Plastic case shielded, meet flammability UL94 V-0
- ◆ Conform to IEC62368/UL62368/EN62368 test standard
- ◆ With CE, RoHS certificate



Application Field

DA 10-220SXXP2D4 Series-----a compact size, high efficient, with CE certificate power converter offered by Aipu. It features universal input voltage range, taking both DC and AC input, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation, with good EMC performance. EMC and Safety specification meet international EN55032, IEC/EN61000 standard. It is widely used in power, industrial, instrument, smart home applications. Please refer to this datasheet when module being used in a bad EMC environment.

Typical Product List

| Certificate | Part No. | Input voltage range | Output voltage/current | | Max. Capacitive Load u F | Ripple & Noise 20MHz mVp-p | Efficiency @full load, nominal input voltage(TYP) % |
|-------------|------------------|-------------------------|------------------------|----------|-----------------------------|----------------------------------|---|
| | | | Vo1(V) | Io1(m A) | | | |
| CE/RoHS | DA10-220S05P2D4 | 90-310VAC 127-438VDC | 5 | 1500 | 6000 | 100 | 74 |
| - | *DA10-220S09P2D4 | | 9 | 1111 | 5000 | 150 | 81 |
| CE/RoHS | DA10-220S12P2D4 | | 12 | 833 | 5000 | 150 | 82 |
| - | *DA10-220S15P2D4 | | 15 | 667 | 4000 | 150 | 82 |
| CE/RoHS | DA10-220S24P2D4 | | 24 | 417 | 500 | 150 | 83 |

Note 1: "*" are models under developing.
 Note 3: The lowest efficiency is -2% of typical value due to instrument tolerance of test equipment.
 Note 4: Output Efficiency(Typ.) is based on that product is full loaded and burned-in after half an hour.

| Input Specifications | Min | Typ. | Max |
|---------------------------|-------------------------|--------|------------------------|
| Input voltage(Vac) | 90Vac(127Vdc) | 220Vac | 310Vac (438Vdc) |
| Input Frequency range(Hz) | 47 | 50 | 63 |
| Standby power consumption | 0.2 W(MAX) | | |
| Input current | 0.18A (MAX) @Vin=100Vac | | 0.12A(MAX) @Vin=220Vac |
| Surge current | 10A (MAX) @Vin=100Vac | | 20A (MAX) @Vin=220Vac |

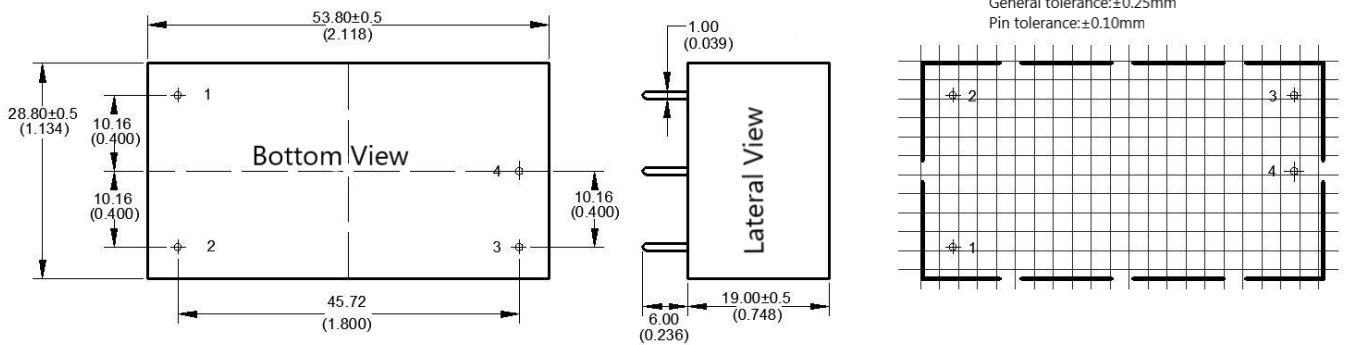


| | | | |
|-------------------------------------|--|--|---------------------------------------|
| Input Capacitor CE1, CE2 | 10uF/450V | | |
| Output Specifications | | | |
| Voltage Accuracy | Vo1±2.0% | | |
| Line Regulation | Nominal load, full input voltage range | Vo1 | ±0.5% |
| Load Regulation | 20% ~ 100% Nominal load | Vo1 | ±1.0% |
| Minimum Load | Single Output | | 10% Load |
| Ripple & Noise | 20MHz BM (full load) | | |
| | Vo≤5.0V, ≤100mVp-p | Vo≥48V, ≤180mVp-p | Other≤150 mVp-p |
| Turn-on Delay Time | Nominal input voltage, full load | ≤1000mS | |
| Power-off Holding Time | Nominal input voltage, full load | 80ms(typ.) | |
| Output Dynamic Characteristics | 25%~50%~25% 50%~75%~50% | Overshoot range(%):≤±5%; Recovery time(mS) ≤5.0mS; | |
| Output Short Circuit Protection | Continuous, Self-recovery | Output Switched off | Hiccup |
| Output Over load/current Protection | ≥110%Po/Io | Output Switched off | Hiccup |
| General Specifications | | | |
| Switching Frequency | - | jitter | 65KHz(typ.) |
| Operating Temperature | The operating temperature range please refer to the temperature derating curve | | -25℃ ~ +65℃ |
| Temperature Drift | - | - | 0.03%/℃ |
| Storage Temperature | - | - | -40℃ ~ +105℃ |
| Max Case Temperature | - | - | +95℃ |
| Relative Humidity | - | - | 10%~90% |
| Isolation Voltage | Input to Output 3100Vac ≤ 5.0mA/1min; | | |
| MTBF | >300,000H @25℃ | | |
| EMC Characteristics | | | |
| EMI | CE | CISPR22/EN55032 CLASS B (see recommended circuit) | |
| | RE | CISPR22/EN55032 CLASS B (see recommended circuit) | |
| EMC | ESD | IEC/EN61000-4-2 | ±6KV/8KV (bare board) Perf.Criteria B |
| | RS | IEC/EN61000-4-3 | 10V/m Perf.Criteria B |
| | EFT | IEC/EN61000-4-4 ±2KV (recommended circuit) Perf.Criteria B | |
| | | IEC/EN61000-4-4 ±2KV (recommended circuit Photo 1) Perf.Criteria B | |
| | Surge | IEC/EN61000-4-5 ±1KV(recommended circuit) Perf.Criteria B | |
| | | IEC/EN61000-4-5 ±2KV(recommended circuit Photo 1) Perf.Criteria B | |

| | | | | |
|--|---|------------------|---------|-----------------|
| | CS | IEC/EN61000-4-6 | 3Vr.m.s | Perf.Criteria B |
| | PFMF | IEC/EN61000-4-8 | 10A/m | Perf.Criteria A |
| | Voltage dips, short interruptions and voltage variations immunity | IEC/EN61000-4-11 | 0%-70% | Perf.Criteria B |

P2 Packing Dimension

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



| | | |
|--------------|------------------|-----------------------|
| Packing Code | L x W x H | |
| P2 | 53.8X28.8X19.0mm | 2.118X1.134X0.748inch |

Pin Definition

| | | | | |
|-----------|-------|-------|-----|-----|
| Pin-Out | 1 | 2 | 3 | 4 |
| Single(S) | AC(N) | AC(L) | +Vo | -Vo |

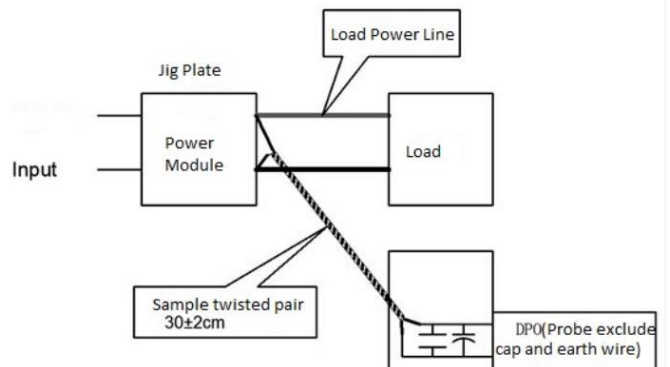
Note: If the definition of pin not is in accordance with the model selection manual, please refer to the label on actual item.

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

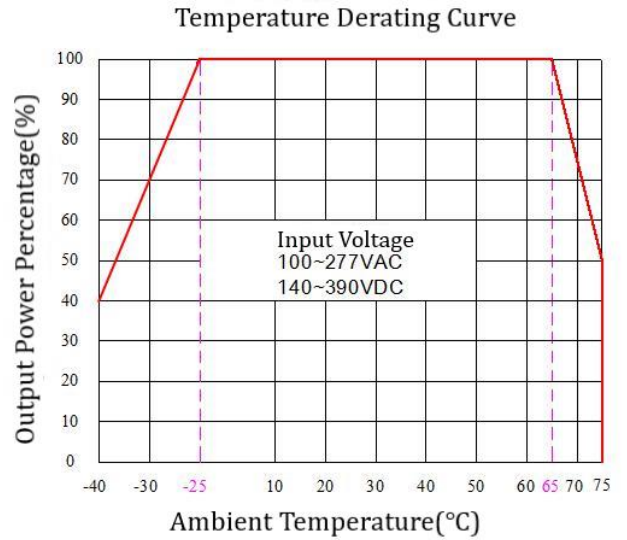
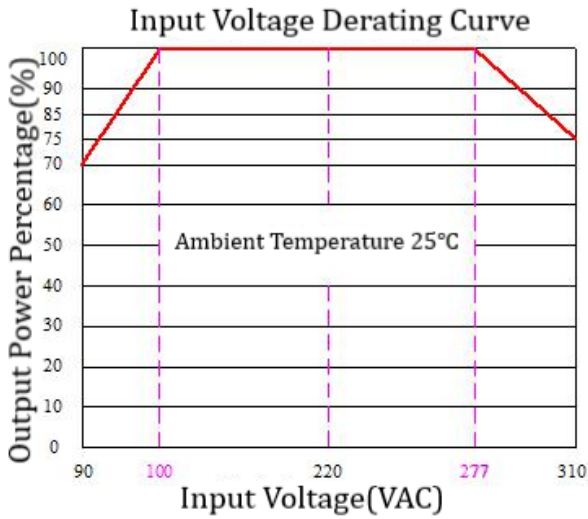
Test Method:

(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 47uF 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

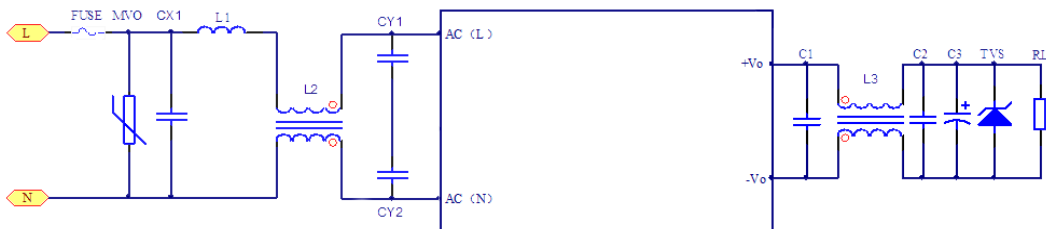


Note 1: Input voltage should be derated based on input voltage derating curve when it is 90~100VAC/277~310VAC/127~140VDC/390~438VDC;

Note 2: This product is suitable to use in natural air cooling environments, if in a closed environment, please contact with us.

Typical Application Circuit

1、EMC Recommended Parameters and Application Circuit



(Photo 1: EMC Recommended Value)

| Part No | C3(u F) | TVS |
|-----------------|---------|---------|
| DA10-220S05P2D4 | 220 | SMBJ7A |
| DA10-220S12P2D4 | | SMBJ20A |
| DA10-220S24P2D4 | 47 | SMBJ30A |

Note 1:

Output filter capacitor C3 is electrolytic capacitor, recommended to use high frequency low resistance one, capacitance and output current please refer to the technical specifications provided by the manufacturers; withstand capacitor C3 voltage derating be 80% or above; capacitor C1,C2 are ceramic capacitors, to remove the high frequency noise, recommend 0.1uF/50V/1206; TVS is a recommended component to protect post-circuits (if converter fails);



| Component | Name | Component Recommended Value |
|-----------|--------------------------------------|--------------------------------------|
| FUSE | Fuse | 3.15A/250Vac, slow fusing, necessary |
| MOV | Voltage dependent resistor | 14D471K |
| CX1 | X Capacitor | 0.22uF/275Vac |
| L1 | Differential mode inductor | 2.5uH/2.5A I inductor |
| L2 | Common mode inductor | Green Ring 15mH/2.5A T12X7X6mm |
| CY1 | Y capacitor | 102M-400Vac |
| CY2 | | |
| L3 | Common mode inductor | Green Ring, T13X8,145uH |
| RL | Customer terminal load (end product) | |

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 not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
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, 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. The datasheet is subject to change without prior notice.