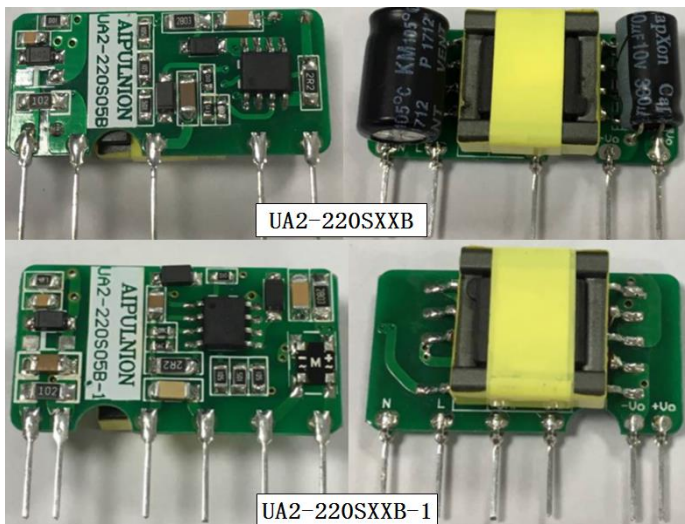




Typical Features

- ◆ Wide input voltage range:85-265VAC/90-380VDC
- ◆ No load power consumption≤0.3W
- ◆ Transfer efficiency (typ.78%)
- ◆ Switching Frequency:65KHz
- ◆ Protections: short circuit, over-current, over-voltage
- ◆ Isolation voltage: 2500Vac
- ◆ Conform to IEC60950/UL60950/EN60950
- ◆ Meet CE, RoHS
- ◆ Ultra small bare board, industrial level design
- ◆ PCB mounting



Application Field

UA2-220SXXB Series----- a compact size, high efficient, meet CE standard power module offered by Aipu.
It features universal input voltage range, DC and AC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation. with good EMC performance, meet international EN55032, IEC/EN61000 standard.
This series have very important application for power, industrial, instrument, smart home field.
The application circuit in the datasheet is strongly recommended for harsh EMC environment.

Typical Product List

| Item No | Output Specifications | | | | | Max. Capacitive Load | Ripple & Noise 20MHz (Max) | Efficiency@ Full Load , 220Vac (Typical) |
|----------------|-----------------------|----------|----------|----------|----------|----------------------|----------------------------|--|
| | Power | Voltage1 | Current1 | Voltage2 | Current2 | | | |
| | (W) | Vo1(V) | Io1(m A) | Vo2(V) | Io2(m A) | | | |
| UA2-220S03B | 2 | 3.3 | 600 | - | - | 820 | 80 | 66 |
| UA2-220S03B-1 | | | | | | | | |
| UA2-220S05B | 2.5 | 5 | 500 | - | - | 680 | 80 | 69 |
| UA2-220S05B-1 | | | | | | | | |
| UA2-220S06B | 2.5 | 6 | 416 | - | - | 600 | 80 | 70 |
| UA2-220S06B-1 | | | | | | | | |
| UA2-220S12B | 2.5 | 12 | 208 | - | - | 470 | 100 | 75 |
| UA2-220S12B-1 | | | | | | | | |
| UA2-220S13B | 2.5 | 13 | 192 | - | - | 300 | 100 | 75 |
| UA2-220S13B-1 | | | | | | | | |
| UA2-220S15B | 2.5 | 15 | 167 | - | - | 300 | 100 | 76 |
| UA2-220S15B-1 | | | | | | | | |
| * UA2-220S24B | 2.5 | 24 | 104 | - | - | 100 | 120 | 78 |
| *UA2-220S24B-1 | | | | | | | | |



Note 1: Due to space limitations, above is only a part of our product list, please contact our sales team for more items.

Note 2: “*” is model being developing.

Note 3: The typical value of output efficiency is based on full load and burn-in after half an hour.

Note 4: The fluctuation range of full load efficiency at table(% ,TYP) is $\pm 2\%$, full load efficiency = total output power/module's input power.

Input Specifications

| Item | Operating Condition | Min | Typ. | Max | Unit |
|---------------------------------|---------------------|--------------------------|------|------|------|
| Input Voltage Range | AC input | 85 | 220 | 265 | VAC |
| | DC input | 90 | 310 | 380 | VDC |
| Input Frequency Range | - | 47 | 50 | 63 | Hz |
| Input Current | 115VAC | / | / | 0.12 | A |
| | 220VAC | / | / | 0.06 | |
| Surge Current | 115VAC | / | / | 11 | |
| | 220VAC | / | / | 21 | |
| Leakage Current | - | 0.25mA TYP/230VAC/50Hz | | | |
| External Fuse Recommended Value | - | 1A-2A/250VAC slow-fusing | | | |
| Hot-plug | - | unavailable | | | |
| Remote Control Terminal | - | unavailable | | | |

Output Specifications

| Item | Operating Condition | Min | Typ. | Max | Unit | |
|---------------------------|--------------------------------------|------------------------------------|-----------|----------|------------|---|
| Voltage Accuracy | Full input voltage range, any load | Vo1 | <5V | ± 10 | ± 15.0 | % |
| | | | $\geq 5V$ | ± 3 | ± 8 | % |
| Line Regulation | Nominal load | Vo1 | - | - | ± 5.0 | % |
| Load Regulation | Nominal input voltage, 20%~100% load | Vo1 | - | - | ± 10 | % |
| No Load Power Consumption | Input 115VAC | - | - | 0.3 | W | |
| | Input 220VAC | - | - | | | |
| Minimum Load | Single Output | 15 | - | - | % | |
| | Dual output Common Ground | - | - | - | % | |
| | Dual output Isolated | - | - | - | | |
| Start-up Delay Time | Nominal input voltage (full load) | - | 100 | - | mS | |
| Power-off Holding Time | Input 115VAC (full load) | - | 10 | - | mS | |
| | Input 220VAC (full load) | - | 60 | - | | |
| Dynamic Response | 25%~50%~25% 50%~75%~50% | Overshoot range(%): $\leq \pm 5.0$ | | | % | |



| | | | | | |
|--------------------------|---|---------------------------|--------|-----|--------|
| | | Recovery time(mS):≤5.0 | | | mS |
| Output Overshoot | Full input voltage range | ≤10%Vo | | | % |
| Short Circuit Protection | | Continuous, Self-recovery | | | Hiccup |
| Temperature Coefficient | - | - | ±0.03% | - | %/°C |
| Over Current Protection | Full input nominal voltage 220VAC | ≥150% Io self-recovery | | | Hiccup |
| Over Voltage Protection | Output 5.0VDC | ≤7.5 | | | VDC |
| | Output 6.0VDC | ≤9 | | | |
| | Output 12VDC | ≤18 | | | |
| | Output 15VDC | ≤20 | | | |
| | Output 24VDC | ≤30 | | | |
| Ripple & Noise | - | - | 80 | 120 | mV |
| | Note 1: Vo≤5VDC,ripple& noise testing should be tested from the min load, Note 2: Ripple & Noise is tested by twisted pair method, for details please see(Ripple& Noise Test) at back. | | | | |

General Specifications

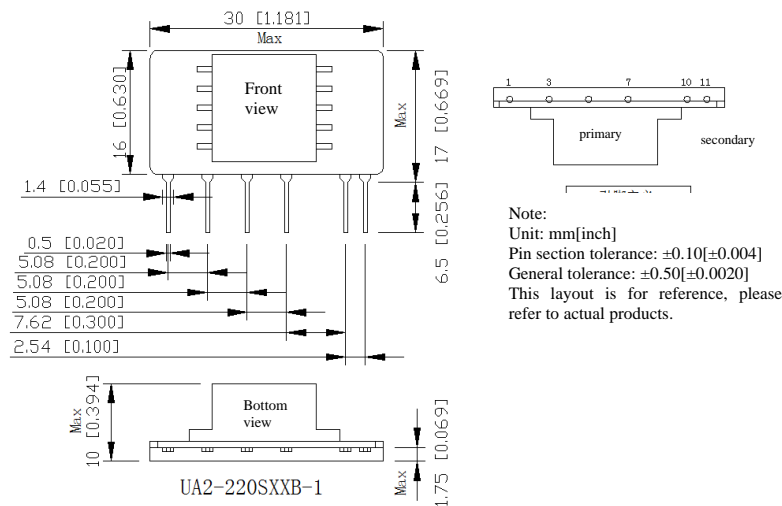
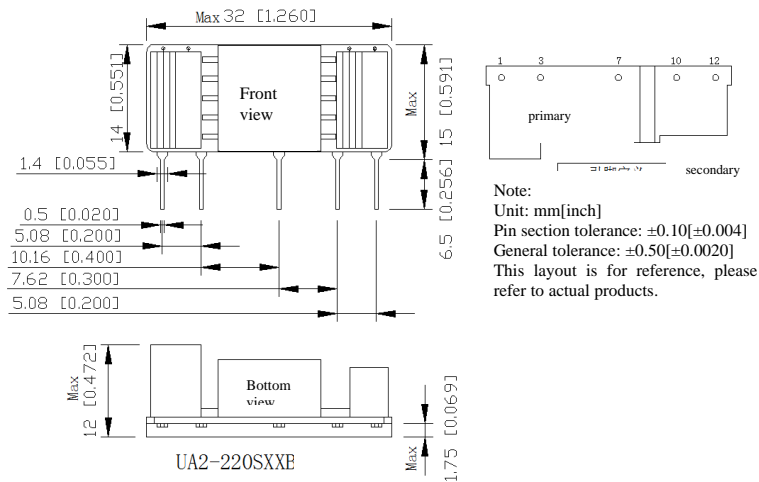
| Item | Operating Condition | Min | Typ. | Max | Unit |
|------------------------|---|------------------------------|------|-----|------|
| Switching Frequency | - | - | 65 | - | KHz |
| Operating Temperature | - | -40 | - | +85 | °C |
| Storage Temperature | - | -40 | - | +85 | |
| Soldering Temperature | Wave-soldering | 260±4°C, timing 5-10S | | | |
| | Manual-soldering | 360±8°C, timing 4-7S | | | |
| Relative Humidity | - | 10 | - | 90 | %RH |
| Isolation Voltage | Input-Output Test 1min, leakage current≤5mA | 2500 | - | | VAC |
| Insulation Resistor | Input-Output@DC500V | 100 | - | | MΩ |
| Safety Standard | - | EN60950, IEC60950 | | | |
| Vibration | - | 10-55Hz,10G,30Min,alongX,Y,Z | | | |
| Safety Class | - | CLASS II | | | |
| Class of Case Material | - | UL94 V-0 | | | |
| MTBF | - | MIL-HDBK-217F@25°C >300,000H | | | |

EMC Characteristics

| Total Item | | Sub Item | Test Standard | Class |
|------------|-----|----------|-----------------|---------------------------------------|
| EMC | EMI | CE | CISPR22/EN55032 | CLASS B(recommend circuit see photo2) |
| | | RE | CISPR22/EN55032 | CLASS B(recommend circuit see photo2) |

| | | | |
|-----|---|------------------|--|
| EMS | RS | IEC/EN61000-4-3 | 10V/m Perf.Criteria B (recommend circuit see photo1) |
| | CS | IEC/EN61000-4-6 | 3Vr.m.s Perf.Criteria B (recommend circuit see photo1) |
| | ESD | IEC/EN61000-4-2 | Contact ±6KV / Air ±8KV Perf.Criteria B |
| | Surge | IEC/EN61000-4-5 | ±1KV Perf.Criteria B |
| | EFT | IEC/EN61000-4-4 | ±2KV Perf.Criteria B |
| | Voltage dips, short interruptions and voltage variations immunity | IEC/EN61000-4-11 | 0%~70% Perf.Criteria B |

Dimension



| Packing Code | L x W x H | |
|--------------|-----------------|---------------------------|
| B | 32 x 15 x 12 mm | 1.260 x 0.591 x 0.472inch |
| B-1 | 30 x 17 x 10 mm | 1.181 x 0.669 x 0.394inch |



Pin Definition

| UA2-220SXXB | | | | | | |
|---------------|-------|-------|------|------|-----|-----|
| Pin-Out | 1 | 3 | 5 | 7 | 10 | 12 |
| Single(S) | AC(N) | AC(L) | NC | GND | -Vo | +Vo |
| UA2-220SXXB-1 | | | | | | |
| Pin-Out | 1 | 3 | 5 | 7 | 10 | 11 |
| Single(S) | AC(N) | AC(L) | +Cap | -Cap | -Vo | +Vo |

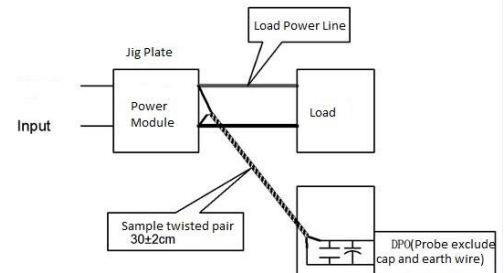
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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

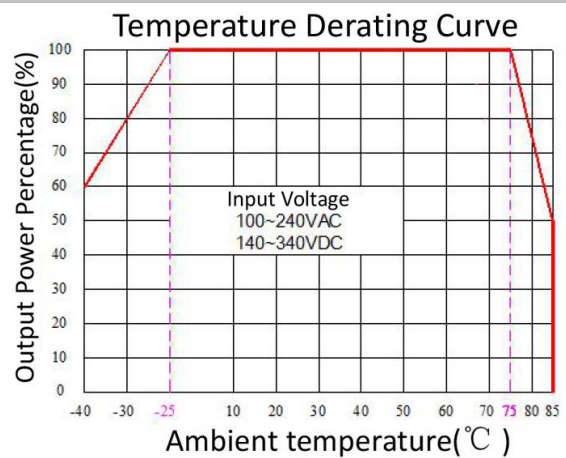
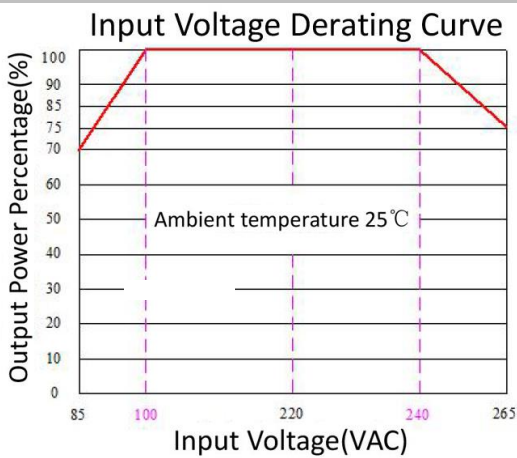
Test Method:

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

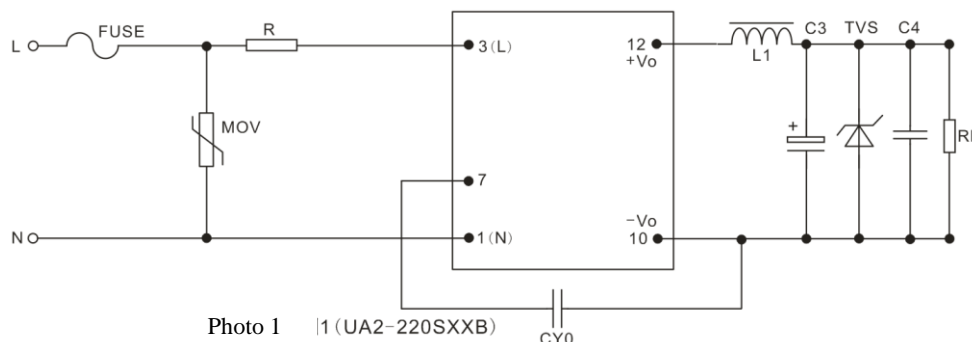


Product Characteristic Curve



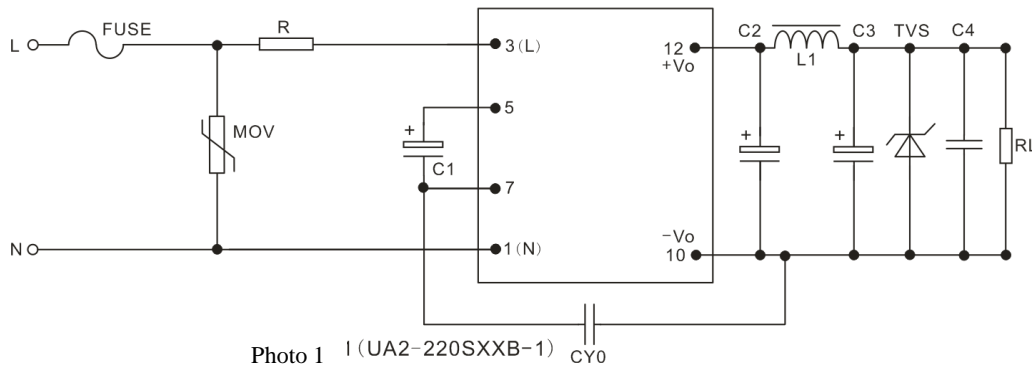
Typical EMC Application Circuit and Recommended Circuit

1. Typical Application Circuit





| Model | L1 | C3 (necessary) | C4 | MOV | R | CY0 | FUSE (necessary) | TVS tube |
|-------------|-------|-------------------|-----------|---------|--------|----------------|---------------------|----------|
| UA2-220S03B | 4.7uH | 200uF/16V | 0.1uF/50V | 10D511K | 12Ω/1W | 1nF/ 400VAC | 1A/300V | SMBJ7.0A |
| UA2-220S05B | | | | | | | | SMBJ12A |
| UA2-220S12B | | | | | | | | SMBJ20A |
| UA2-220S13B | | 100uF/35V | | | | | | SMBJ20A |
| UA2-220S15B | | | | | | | | SMBJ20A |
| UA2-220S24B | | | | | | | | SMBJ30A |

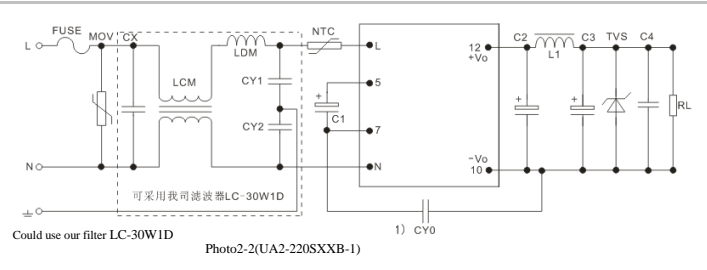
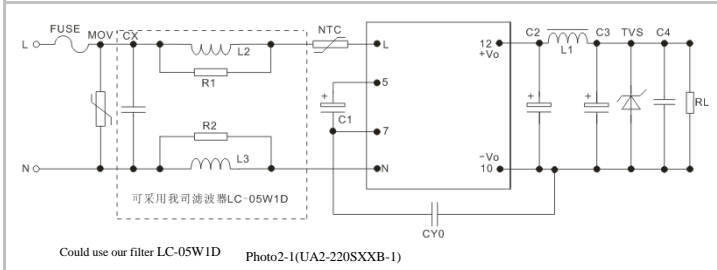
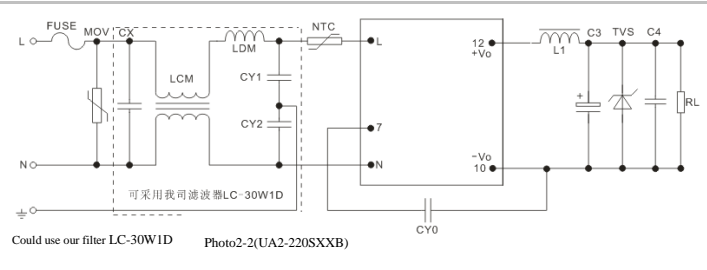
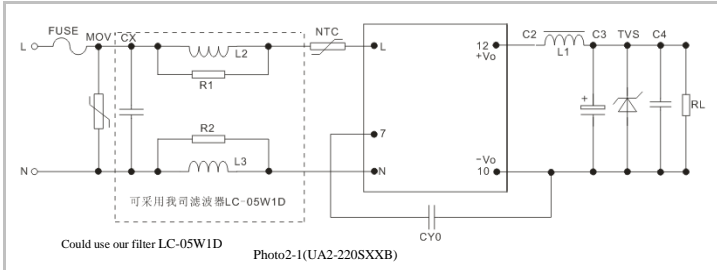


| Model | C1 (necessar y) | C2 (necessary) | L1 | C3 (necessary) | C4 | MOV | R | CY0 | FUSE (necessary) | TVS tube |
|---------------|-----------------------|-------------------|-------|-------------------|-----------|---------|--------|--------------------|---------------------|--------------|
| UA2-220S03B-1 | 6.8uF /400V | 680uF/16V | 4.7uH | 220uF/16V | 0.1uF/50V | 10D511K | 12Ω/1W | 1nF/ 400VA C | 1A/300V | SMBJ7.0 A |
| UA2-220S05B-1 | | | | | | | | | | SMBJ12A |
| UA2-220S12B-1 | 10uF /400V | 470uF/16V | | | | | | | | 100uF/35V |
| UA2-220S12B-1 | | | | SMBJ20A | | | | | | |
| UA2-220S15B-1 | | 150uF/35V | | SMBJ20A | | | | | | |
| UA2-220S24B-1 | | | | SMBJ30A | | | | | | |

Note:

- C1 : AC input, C1 is input filter electrolytic capacitor(which is required), recommend value 6.8uF/400V or 10uF/400V.
DC input, C1 is a big filtering capacitor in EMC filter(which is required), recommend value 6.8uF/400V or 10uF/400V.
- R1 :current-limit resistor, recommended 12Ω/1W.

2. EMC recommended circuit(under high EMC request)



| FUSE | Recommended 1A, 300Vac (necessary) | NTC | 13D-5 | R1,R2 | Resistance above 2.2K,1/8W |
|------|---------------------------------------|---------|----------------------------|-------|-------------------------------|
| MOV | 10D511K | CY1,CY2 | 1nF/400VAC | | |
| CX | 0.1uF/275Vac | LDM | 330uH | | |
| LCM | 10mH | L2,L3 | Color ring inductor 1mH,1W | | |

Note:

- The product should be used within the specification range, or it will cause permanent damage to it;
- The input terminal should connect to fuse;
- If the product is operated under the minimum requested load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
- 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;
- 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);
- All index testing methods in this datasheet are based on our Company's corporate standards;
- 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;
- We can provide product customization service,
- Specifications are subject to change without prior notice, please follow our website for newest manual.