# 550ACMOP_SC4 series

550W - Open Frame Type Switching Power Supply - Universal Input - Isolated & Regulated

## AC-DC Converter 550 Watt

- Universal 90 - 264VAC or 127 - 370VDC input voltage
- Operating ambient temperature range: -40°C to +70°C
- Built-in active PFC function
- Output short circuit,
- Over-current, over-voltage protection and over-temperature protection
- 320W with air cooling, 550W with 25CFM
- 5VDC standby output, 12VDC fan supply, power good, power fail and remote sense
- Suitable for BF application
- Safety according to IEC/EN/UL62368, IEC/EN61558, GB4943, IEC/EN/ES60601-1 (3rd Edition), medical safety certification (2 x MOPP), IEC60601-1-220; 14 (4th Edition)
- Operating altitude up to 5000m

UL-62368-1 (E347551) Pending
UL-60601-1 (E486991) Pending

The 550ACMOP_SC4 series is an AC-DC miniaturize open frame power supply and suitable for all kinds of BF type (be accessible to patients) medical system equipment. It features universal AC input and at the same time accepts DC input voltage, cost-effective, low no load power consumption, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet IEC/EN/UL62368, GB4943, IEC/EN60335, IEC/EN61558, IEC/EN/ES60601-1 standards and they are widely used in areas of industrial, LED, street light control, electricity, security, telecommunications, smart home, etc.

### Common specifications

| | |
|---|---|
| Short circuit protection | Hiccup, continuous, self-recover (Recover time <5s after the short circuit disappear) |
| Operating temperature range | -40°C ~ +70°C |
| Storage temperature range | -40°C ~ +85°C |
| Storage Humidity | 10% ~ 90% RH (Non-condensing) |
| Operating Humidity | 20% ~ 90% RH (Non-condensing) |
| Power Derating (Operating temperature derating) | 25CFM<br>• +40°C to +50°C 0 %/°C<br>• +50°C to +70°C 2..5 %/°C |
| Power Derating (Air cooling) | 230V/ 320W<br>• +45°C to +50°C 4.0 W/°C<br>• +50°C to +60°C 2.5 W/°C<br>115V/310W<br>+30°C to +40°C 1.0 W/°C<br>+40°C to +50°C 6.0 W/°C<br>+50°C to +60°C 4.0 W/°C |
| Power Derating (Input voltage derating) | 90VAC -115VAC 1.0 %/VAC<br>115VAC - 264VAC 0 %/VAC<br>127VDC -160VDC 1.0 %/VDC<br>160VDC - 370VDC 0 %/VDC |
| Safety standards | IEC/EN/UL62368/EN60335/GB4943 |
| Safety Certification | IEC/EN/UL/CB62368/EN60601 (Pending) |
| Safety Class | CLASS I |
| MTBF (MIL-HDBK-217F@25°C) | >200,000 h |
| Case Material | Open frame |
| Dimension | 127×76.2×40.5mm (12V/15V)<br>127×76.2×38.5mm (24V/27V/36V/48V) |
| Weight | 490g (Typ.) 12V/15V<br>470g (Typ.) 24V/27V/36V/48V |
| Cooling Method* | 310W/320W Air cooling; 500W/550W 25CFM |

Note: *Cooling method and power derating refer to typical characteristic curves.

### Input specifications

| Item | Test conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Input Voltage Range | AC input<br>DC input | 90<br>127 | | 264<br>370 | VAC<br>VDC |
| Input Frequency | | 47 | | 63 | Hz |
| Input Current | 90VAC/115VAC<br>230VAC | | | 6.5<br>3.0 | A<br>A |
| Inrush Current (Cold start) | 115VAC<br>230VAC | | 50<br>80 | | A<br>A |
| Power Factor (Full load) | 115VAC<br>230VAC | 0.98<br>0.95 | | | A<br>A |
| Leakage Current (264VAC) | • Contact leakage current<br>• Earth leakage current | | <0.1mA<br><0.5mA | | |
| Hot Plug | Unavailable | | | | |

### Output specifications

| Item | Test conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Voltage accuracy (Full load) | • 12V/15V/24V/27V<br>• 36V/48V | | ±2<br>±1 | | %<br>% |
| Line Regulation | Rated load | | ±0.5 | | % |
| Load Regulation | 0%-100% load | | ±1 | | % |
| Ripple & Noise* | 20MHz bandwidth | | | 200 | mV |
| Temp. Coefficient | | | ±0.03 | | %/°C |
| Minimum Load | | | 0 | | % |
| Hold-up time | 25°C, 115VAC input<br>25°C, 230VAC input | | 10<br>10 | | ms<br>ms |
| Stand-by Power Consumption | Room temperature, 230VAC input, (PS-ON Low potential) | | | 0.5 | W |
| Over-current Protection | ≥105%Io, hiccup, self-recover | | | | |
| Over-voltage Protection* | 12V ≤15.6VDC***<br>15V ≤19.5VDC***<br>24V ≤31.2VDC***<br>27V ≤35.1VDC***<br>36V ≤46.8VDC***<br>48V ≤60.0VDC*** | | | | |
| Over-temperature Protection* | Output voltage turn off, auto recover after the temperature drops | | | | |
| Fan Power* | Offer output power of 12V/0.5A | | | | |
| PS_ON Input Signal* | Power on; PS_ON High<br>Power off; PS_ON Low | 2<br>0 | | 5<br>0.5 | V<br>V |
| PG Signal* (Power on) | The PG signal goes high with 10ms to 500ms delay after | 2<br>0 | | 5<br>0.5 | V<br>V |
| PG Signal* (Power off/ Power fail ) | The TTL signal goes low at least 1ms before output | 2<br>0 | | 5<br>0.5 | V<br>V |
| PG Signal* (High level) | High | 2 | | 6 | V |
| PG Signal* (Low level) | Low | 0 | | 0.6 | V |
| Remote Sense* | When RS+ and RS- are connected to the system, with function of remote voltage compensation, if not needed, left RS+ and RS open | | | | |
| 5V Standby* | 5Vsb: The load capacity is 0.6A without fan, the load capacity is 1A with fan 25CFM; tolerance 2%, ripple: 120mVp-p(max.) | | | | |

1.*Output Voltage Accuracy : including setting error, line regulation, load regulation;
2.*The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor (Low ESR) and 0.1uF ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information;
3.*Over-temperature Protection: use the discharge pen to release the input electrolytic charge completely, and then test the restart auto recover.
4.*For all the above test items, please refer to our company standard „AC-DC Black Box Test Specification" for specific test specifications and methods;
5.*For fan power connection method, please refer to 5, 6 in the external dimension drawing;
6.*For PS_ON, 5V standby connection method, please refer to CN6 in the external dimension drawing;
7.*For PG standby connection method, please refer to CN2 in the external dimension drawing;


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# 550ACMOP_SC4 series

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| EMC specifications | | |
|---|---|---|
| Emissions | CE | EN55032(CISPR32)/EN55011(CISPR32) CLASS B |
| Emissions | RE | EN55032(CISPR32)/EN55011(CISPR32) CLASS B |
| Emissions | Harmonic current | IEC/EN61000-3-2 CLASS A and CLASS D |
| Emissions | Flicker | EC/EN61000-3-3 |
| Immunity | ESD | IEC/EN61000-4-2 Contact ±8KV/Air ±15KV perf. Criteria A |
| Immunity | RS | IEC/EN61000-4-3 10V/m perf. Criteria A |
| Immunity | EFT | IEC/EN61000-4-4 ±2KV perf. Criteria A |
| Immunity | Surge | IEC/EN61000-4-5 line to line ±2KV, line to ground ±4KV perf. Criteria A |
| Immunity | CS | IEC/EN61000-4-6 10Vr.m.s perf. Criteria A |
| Immunity | DIP IEC/EN61000-4-11 0%, 70% | DIP IEC/EN61000-4-11 0%, 70% perf. Criteria A |

Notes: 1.*The power supply is considerated a component as part of system, all EMC items are tested on a metal plate (L x W x H, 360mm x 360mm x 1mm). Power supply should be combined with final equipment for EMC confirmation.

**Example:**
**550ACMOP_12SC4**
**550 = 550Watt; AC = AC-DC; MOP = series; 12 = 12Vout;**
**S = Single Output; C = PFC; 4 = 4kVAC isolation**

| Isolation specifications | | | | | |
|---|---|---|---|---|---|
| Item | Test conditions | Min | Typ | Max | Units |
| Isolation Test | Electric strength test for 1min., leakage current <5mA | | | | |
| | • Input - output | 4000 | | | VAC |
| | • Input - ⏚ | 2000 | | | VAC |
| | • Output- ⏚ | 1500 | | | VAC |
| Insulation Resistance | Environment temperature: 25±5°C, Relative humidity: <95%RH, non-condensing Testing voltage: 500VDC | | | | |
| | • Input - output | 100 | | | MΩ |
| | • Input - ⏚ | 100 | | | MΩ |
| | • Output - ⏚ | 100 | | | MΩ |
| Isolation level | • Input - output | 2 × MOPP | | | |
| | • Input - ⏚ | 1 × MOPP | | | |
| | • Output - ⏚ | 1 × MOPP | | | |

Note:
1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH with nominal input voltage and rated output load;
2. All index testing methods in this datasheet are based on our company corporate standards;
3. In order to improve the efficiency, there will be audible noise generated when work at light load, but it does not affect product performance and reliability;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see „Features" and „EMC";
6. The out case needs to be connected to PE ( ⏚ ) of system when the terminal equipment in operating;
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
8. The power supply is considered a component which will be installed into a terminal

# Product Selection Guide

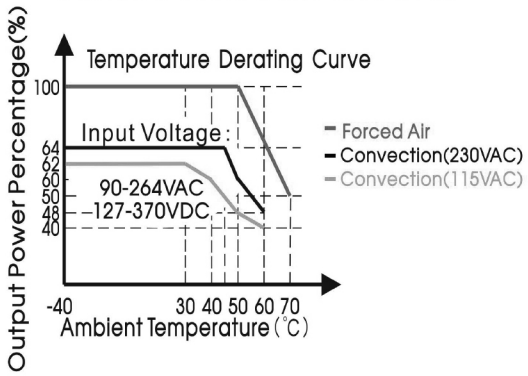
| Approval | Model[1)] | Cooling method | Power [W] | Nominal Output Voltage and Current [Vo/Io] | Output Adjustable Range ADJ(V) | Efficiency[5)] [230VAC, %, typ] | Capacitive Load [µF, max] |
|---|---|---|---|---|---|---|---|
| UL (Pending) | 550ACMOP_12SC4 | Air cooling 25CFM | 320.4<br>499.2 | 12V/26.7<br>12V/41.6 | 11.4-12.6 | 91 | 6000 |
| UL (Pending) | 550ACMOP_15SC4 | Air cooling 25CFM | 319.5<br>499.5 | 15V/21.3<br>15V/33.3 | 14.25-15.75 | 92 | 6000 |
| UL (Pending) | 550ACMOP_24SC4 | Air cooling 25CFM | 321.6<br>549.6 | 24V/13.4<br>24V/22.9 | 22.8-25.2 | 93 | 6000 |
| UL (Pending) | 550ACMOP_27SC4 | Air cooling 25CFM | 321.3<br>550.8 | 27V/11.9<br>27V/20.4 | 25.65-28.35 | 93.5 | 4000 |
| UL (Pending) | 550ACMOP_36SC4 | Air cooling 25CFM | 320.4<br>550.8 | 36V/8.9<br>36V/15.3 | 34.2 - 37.8 | 93 | 3000 |
| UL (Pending) | 550ACMOP_48SC4 | Air cooling 25CFM | 321.6<br>550 | 48V/6.7<br>48V/11.46 | 45.6-50.4 | 94 | 2000 |

Notes: 1.*Under any conditions, the total power of the product should not exceed the rated power. When the output voltage is increased, the total output power cannot exceed the rated output power, when the output voltage is decreased, the output current cannot exceed the rated output current;
2.*When measuring the full load efficiency, the fan should be connected to an external power supply. Fan loss is not included in the input power;

# Typical characteristics

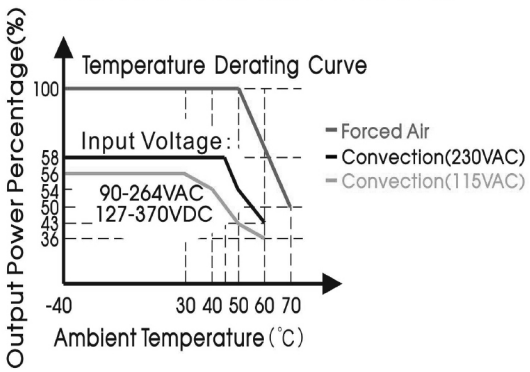
550ACMOP_(12/15)SC4

(full load 500W with Forced Air)



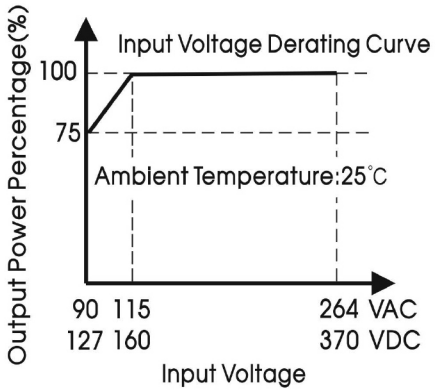

550ACMOP_(24/27/36/48)SC4

(full load 550W with Forced Air)



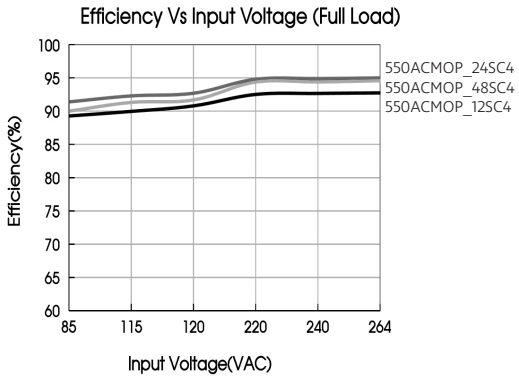

550ACMOP_xxSC4

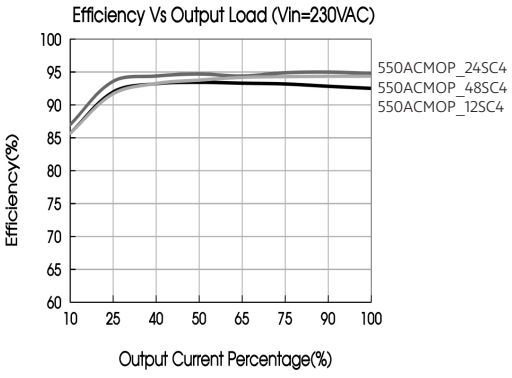
Input Voltage Derating Curve



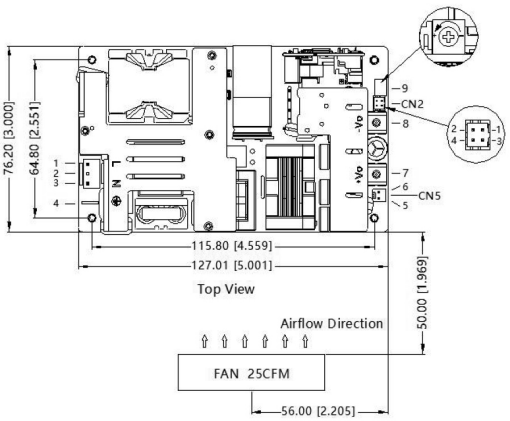

Note: With an AC input voltage between 90 - 115VAC and a DC input between 127 - 160VDC the output power must be derated as per the temperature derating curvescurves

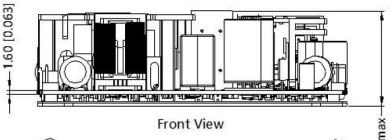
# Efficiency

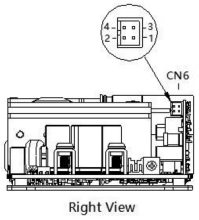


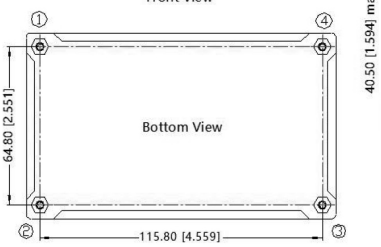



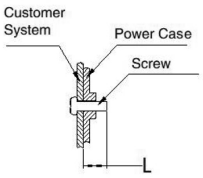
# Mechanical specifications




| Position | Screw Spec. | L(Recommend) | Torque(max) |
|---|---|---|---|
| ① - ④ | M3 | 2.5mm | 0.4N·m |

THIRD ANGLE PROJECTION

| Pin-Out | | Customer Connector |
|---|---|---|
| Pin | Mark | |
| 1 | AC(L) | Housing: JST VHR or equivalent<br>Contact: JST SVH-21T-P1.1 or equivalent |
| 2 | NC | |
| 3 | AC(N) | |
| 4 | ⏚ | |
| 5 | FAN+ | CN5: Fan power output port<br>Housing: TKP 2502 or equivalent<br>Contact: TKP 8811 or equivalent |
| 6 | FAN- | |
| 7 | +Vo | |
| 8 | -Vo | |
| 9 | ADJ Output adjustable resistor | |

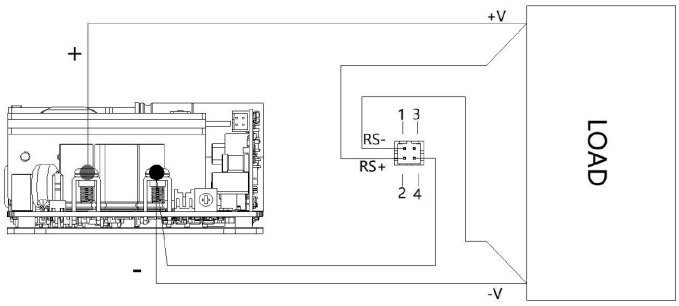
CN6: PS_ON signal input port(3-4) 5VDC Standby output(1-2)

| Pin-Out | | Customer Connector |
|---|---|---|
| Pin | Mark | |
| 1 | +5V | Housing: JST PHD-2*2Y or equivalent<br>Contact: JST PHD-TE or equivalent |
| 2 | GND | |
| 3 | PS-ON | |
| 4 | GND | |

CN2: Remote sensing signal input port(1-2) PG signal(3-4)

| Pin-Out | | Customer Connector |
|---|---|---|
| Pin | Mark | |
| 1 | RS- | Housing: JST PHD-2*2Y or equivalent<br>Contact: JST PHD-TE or equivalent |
| 2 | RS+ | |
| 3 | GND | |
| 4 | PG | |

Note:
1. Unit: mm[inch]
2. Pin7,8 connector tightening torque: M4, 1.2N • m(max)
3. General tolerances: ±1.00[±0.039]
4. The layout of the device is for reference only , please refer to the actual product
5. It is recommended 10mm distance between the PCB and other components for safety purpose
6. Class I system ①②④ positions must be connected to the earth ⏚




Remote sensing function wiring diagram

Note:
1. RS-and RS+cannot be shorted or reversed, otherwise the power module will be damaged;
2. The remote compensation function can compensate the voltage drop on the output cable, which includes the sum of the cable drop connected to the output positive terminal and the output negative terminal;
3. If you need to use remote compensation function, the signal pin needs to be connected with the load and with a twisted pair, otherwise the power module will be damaged.