# R4850G2 Rectifier User Manual V2.2

## Key Specifications

| | |
|---|---|
| Efficiency | Peak efficiency: ≥ 96%<br>≥ 95% (230 V AC, 30%–80% load) |
| Dimensions (H x W x D) | 40.8 mm x 105 mm x 269 mm |
| Weight | ≤ 2 kg |
| Cooling mode | Built-in fan (fan speed adjustable) |
| IP rating | IP20 |

## Overview

The R4850G2 is a digital rectifier with high efficiency and high power density. It supports a wide input voltage range and provides 53.5 V DC default output voltage. The rectifier provides comprehensive protection, supports soft start, and produces low noise. Multiple rectifiers can be connected in parallel. With the power monitoring technology, states of the rectifier and load are monitored in real time, and the output voltage can be adjusted.

## Key Features

- Wide input voltage range
- Wide operating temperature range
- Low total harmonic distortion (THD)
- Full digital control
- Hot swappable
- Supports a smart electricity meter
- Supports CAN bus communication
- Supports LED alarm display
- Supports voltage adjustment, current adjustment, and current equalization
- Disconnects at above 320 V AC
- RoHS compliance
- TUV, CE and UL certifications, CB certificate

## Environment Specifications

| Item | Specifications |
|---|---|
| Operating temperature range | –40℃ to +75℃ |
| Storage temperature range | –40℃ to +75℃ |
| Relative humidity | 5% RH–95% RH (non-condensing) |
| Altitude | ≤ 5000 m (When the altitude ranges from 3000 m to 5000 m, the operating temperature decreases by 1℃ for each additional 200 m.) |
| Environmental requirements | • There should be no conductive dust, corrosive gas, or explosion hazard.<br>• Dust, corrosive substances, pests, molds, and other indicators should be controlled in accordance with Class 3.1 requirements in ETSI EN 300 019-1-3 (V2.3.2 or a later version).<br>• If the module is configured in a direct ventilation cabinet or an outdoor cabinet, the IP rating of the cabinet must be greater than or equal to IP55. |

## Electrical Specifications

| Item | Specifications |
|---|---|
| **Input** | |
| Input voltage range | 85 V AC–290 V AC |
| Input frequency | 45 Hz–66 Hz<br>Rated frequency: 50 Hz/60 Hz |
| Rated input current | ≤ 16 A |
| Power factor | ≥ 0.99 (100% load) |
| THD | ≤ 5% (50%–100% load) |
| **Output** | |
| Output voltage | 42 V DC–58 V DC<br>Rated voltage: 53.5 V DC |
| Linear power derating | 3000 W (176 V AC–290 V AC)<br>3000 W–1250 W (175 V AC–85 V AC) |
| Regulated voltage precision | ≤ ±0.2% Vo |
| Ripple and noise | ≤ 200 mVp-p (bandwidth ≤ 20 MHz) |
| Dynamic response | • 25%–50%, 50%–75% load:<br>– Overshoot: ≤ ±5%<br>– Recovery time: ≤ 200 μs (±0.6% Vo)<br>• 10%–90% load:<br>– Recovery time 1: ≤ 50 μs (±5% Vo)<br>– Recovery time 2: ≤ 1 ms (±1% Vo) |
| Standby power consumption | ≤ 5 W |
| Startup time | 3s–10s |
| Output hold-up time | > 10 ms |

| Item | Specifications |
|---|---|
| **Output** | |
| Psophometrically weighted noise voltage | ≤ 2 mV |
| Wide-band noise voltage | ≤ 50 mV (3.4 kHz–150 kHz)<br>≤ 20 mV (0.15 MHz–30 MHz) |

## Other Specifications

| Item | Specifications |
|---|---|
| **Protection** | |
| Input overvoltage protection | Protection threshold: > 300 V AC |
| | Recovery range: 290 V AC–300 V AC |
| Input undervoltage protection | Protection threshold: < 80 V AC |
| | Recovery range: 80 V AC–90 V AC |
| Output overvoltage protection | Protection range: 56 V DC–60 V DC (can be set on the monitoring module)<br>1.If overvoltage occurs inside a rectifier, the rectifier will latch off.<br>2.If the external voltage is greater than 63 V DC for about 500 ms, the rectifier will latch off. |
| Output current limiting protection | See Figure 1. |
| Output short-circuit protection | A long term short circuit is allowed. After the fault disappears, the rectifier is restored to a healthy state automatically. |
| Overtemperature protection | Supported |
| **Safety/EMC/Surge Protection** | |
| Certification & Safety | • TUV, CE and UL certifications, CB certificate<br>• Complies with IEC 62368-1, CAN/CSA-C22.2 No. 62368 -1, and EN 62368-1.<br>• Complies with IEC 60950-1, CAN/CSA-C22.2 No. 60950 -1, and EN 60950-1. |
| EMC | EN 55032<br>EN 55024<br>ETSI EN 300 386<br>IEC 61000-3-2<br>IEC 61000-3-3<br>IEC 61000-6-1<br>IEC 61000-6-2<br>IEC 61000-6-3<br>IEC 61000-6-4 |
| Surge protection | 5 kA (8/20 μS) |
| **Reliability** | |
| MTBF | > 500,000 hours (40° C) |
| **Audible Noise** | |
| Specifications | ≤ 55 dB (A) (40° C) |

## Output Feature Curves

Figure 1 Output feature curve

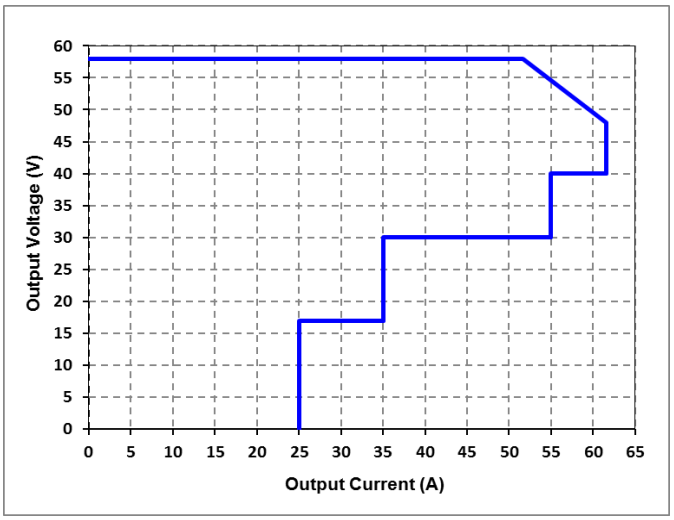



Figure 2 Output efficiency curves

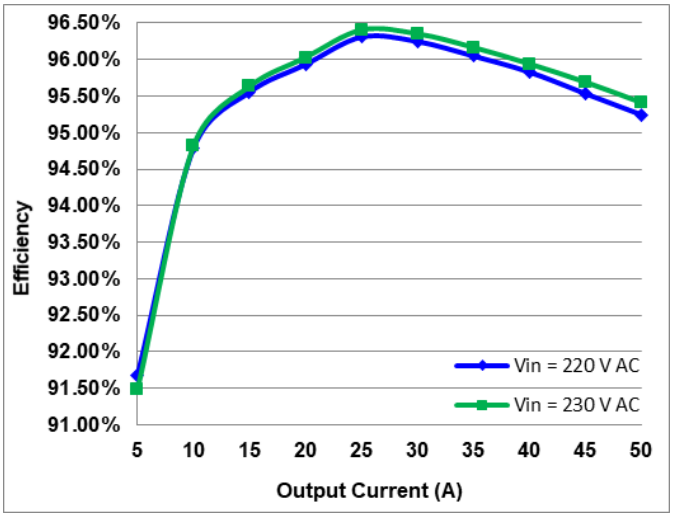
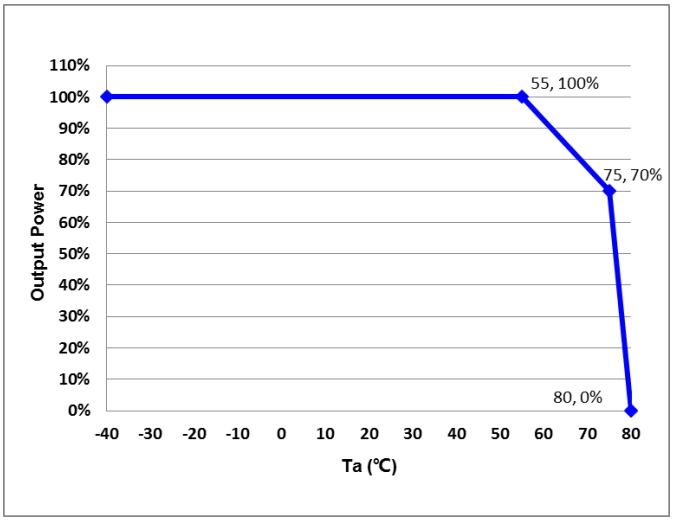



Figure 3 Output power derating curve



## Port Description

Figure 4 Rectifier edge connectors

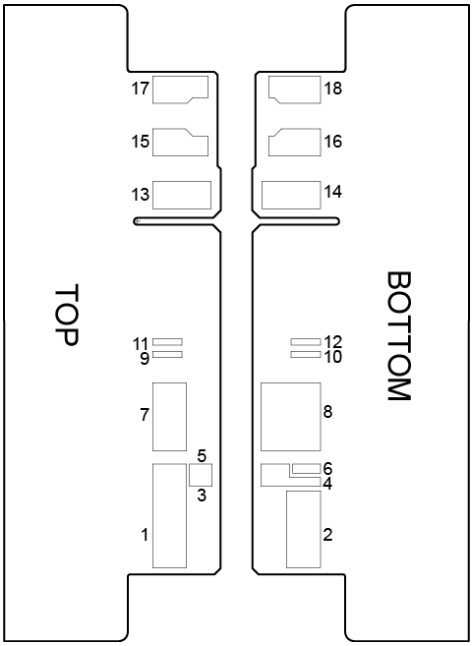



Table 1 Rectifier edge connector definitions

| Pin | Definition | Function |
|---|---|---|
| 1–2 | OUTPUT- | Output 48 V– |
| 3–5 | PRE-CHARGE | Precharging |
| 6 | PRESENT | Rectifier in-position detection |
| 7–8 | OUTPUT+ | Output 48 V+ |
| 9 | AC_D2 | Slot detection signal 2 |
| 10 | AC_D1 | Slot detection signal 1 |
| 11 | CANL | CAN low level |
| 12 | CANH | CAN high level |
| 13–14 | PE | Protective earth |
| 15–16 | N | AC input neutral wire |
| 17–18 | L | AC input live wire |

**CAUTION**

- Only trained and qualified personnel can be allowed to install or service the module.
- Each of the L and N route of the rectifier has a fuse.
- This product should be used in an environment that meets specifications described in the user manual.
- If the product is used with abnormal grid input or exposed to salt mist, dust, or water mist, the product may become faulty, and the resulting product exceptions or component damage are beyond the warranty scope.
- To prevent burns, wear protective gloves and exercise caution when removing a rectifier because it is hot during operation.

**CAUTION**

- If the red indicator is on or the green indicator is off, check the PSU first and then power it on. (Shake the PSU to check whether there is abnormal sound, check whether the PSU has an odor, whether the edge connector is clean and intact, and whether the L/N and PE pins of the edge connector are short-circuited.) Do not directly power on the PSU. Otherwise, it may arc or become faulty.

## Replacing a Rectifier

Figure 5 Removing a rectifier

Step 1: Push the locking latch left.

Step 2: Pull out the handle and remove the rectifier from the subrack.

Figure 6 Installing a rectifier

Step 1: Place a new rectifier in the correct slot, push the locking latch left, and pull out the handle.

Step 2: Gently push the rectifier along the guide rails into the subrack, close the handle, and flip the locking latch right to secure the handle.

## Transportation

During transportation, the product must be securely placed in a packing case. The packing case must comply with related international standards and be printed with marks such as anti-collision and moisture prevention. The packing case containing the product can be transported by any means. Protect the packing case with the product from being dampened and knocked.

## Storage

Unused products must be stored in packing cases and placed in a dry, well-ventilated warehouse where the relative humidity is not greater than 80%, and no corrosive gas exists.

**CAUTION**

- In an indoor scenario, you are advised to power on the rectifier within seven days after unpacking. If the rectifier cannot be powered on in time, place it in an indoor environment that is dry and without corrosive gas.
- In an outdoor scenario, you are advised to power on the rectifier within 24 hours after unpacking. If the rectifier cannot be powered on in time, place it in an indoor environment that is dry and without corrosive gas.

## Maintenance

**DANGER**

- The equipment is powered by high-voltage electricity. Direct or indirect contact (especially through damp objects) with high-voltage electricity may result in serious injury or death.
- Non-standard and improper high-voltage operations may result in accidents such as fire or electric shock.

Table 2 describes the states of LEDs and the causes for faults.
Table 2 LED description

| Indicator | Color | Status | Description | Suggestion |
|---|---|---|---|---|
| Power indicator  | Green | Steady on | The rectifier has AC input. | The status is normal. |
| | | Off | The rectifier has no AC input. | • Check whether the input voltage is normal.<br>• If the input is normal, replace the rectifier. |
| | | | The rectifier is faulty. | Replace the rectifier. |
| | | Blinking at 0.5 Hz | The rectifier is being queried. | The status is normal. |
| | | Blinking at 4 Hz | The rectifier is loading an application program. | The rectifier automatically recovers after the loading is finished, and no action is required. |
| Alarm indicator  | Yellow | Off | The rectifier is not protected, and there is no alarm. | The status is normal. |
| | | Steady on | The rectifier has generated an alarm due to ambient overtemperature.<br>The rectifier has generated a shutdown alarm for protection due to ambient overtemperature or undertemperature. | Check that the air vent is not blocked and the ambient temperature is within the normal range. |
| | | | The rectifier is protected against input over/undervoltage. | Check the power grid voltage. |
| | | | The rectifier is hibernating. | The status is normal. |
| | | Blinking at 0.5 Hz | The communication between the rectifier and the monitoring module is interrupted. | Replace the rectifier or monitoring module. |
| Fault indicator  | Red | Off | The rectifier is normal. | The status is normal. |
| | | Steady on | The rectifier latches off due to output overvoltage, or the rectifier is not properly inserted. | Remove the rectifier and then insert it after 1 minute. |
| | | | The rectifier has no output due to an internal fault. | Replace the rectifier. |

## Suggestions

1. Rectify a fault by referring to Table 2.
2. If you cannot rectify the fault according to Table 2, replace the rectifier.
3. Return the faulty rectifier to Huawei for repair.

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