## AAU5639w

# Description

| | |
|---|---|
| **Issue** | **03** |
| **Date** | **2020-06-30** |

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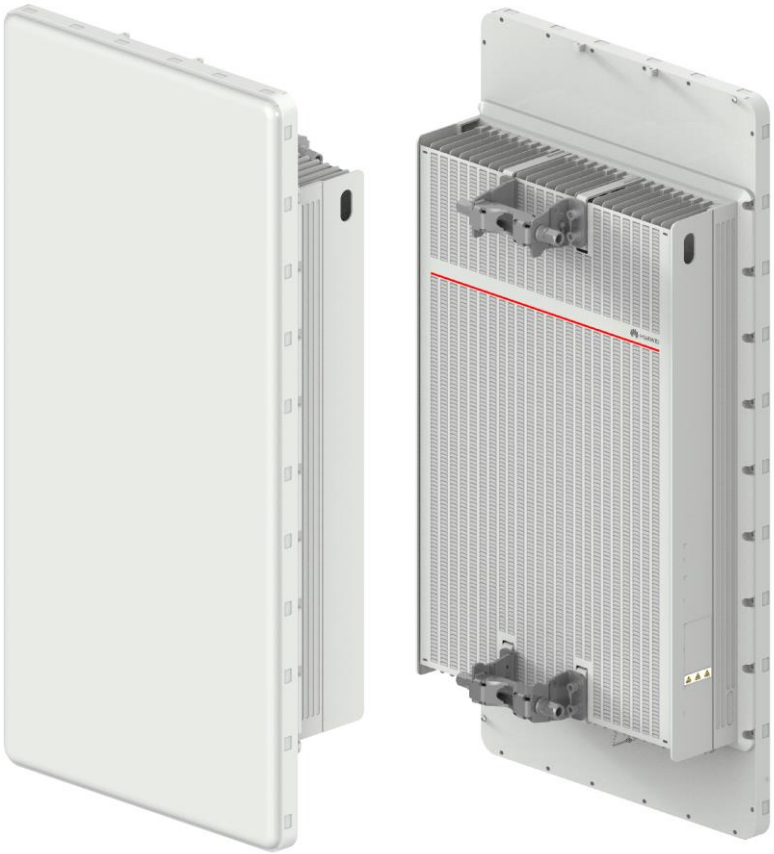


## Product Version

| Product Name | Earliest Mapping Software Version of the Base Station | PnP Software Version Supported by the Base Station |
|---|---|---|
| AAU5639w (2496 MHz to 2690 MHz) | SRAN16.0 | SRAN15.1 |
| AAU5639w (3400 MHz to 3600 MHz) | SRAN16.0 | SRAN15.1 |
| AAU5639w (3420 MHz to 3600 MHz) | SRAN16.1 | SRAN15.1 |
| AAU5639w (3450 MHz to 3700 MHz) | SRAN16.1 | SRAN15.1 |
| AAU5639w (3600 MHz to 3800 MHz) | SRAN16.0 | SRAN15.1 |

# 2 Product Characteristics

## Leading Performance

- **Multiple channels**

  The AAU5639w uses the massive MIMO technology and supports 64T64R.

  Massive MIMO features the adoption of massive antenna arrays for joint signal reception and demodulation or transmission, and therefore significantly enhances single-user link performance and multi-user spatial multiplexing capability, and improves system link quality and transmission rates when compared with traditional multiple-antenna technologies. Massive MIMO also increases the degrees of freedom on the vertical plane and enables the system to flexibly adjust beam forms in both the horizontal and vertical planes, significantly enhancing 3D coverage capability.

- **Large bandwidth**

  The AAU5639w supports a large bandwidth and C-band/2.6 GHz deployment.

  C-band/2.6 GHz band is a mainstream frequency band and has abundant spectrum resources. Operators can obtain more than 100 MHz bandwidth in the frequency band. The AAU supports diverse operators' spectrum resources in C-band/2.6 GHz band. Only one such module is required to complete the C-band/2.6 GHz deployment, saving site antenna space and reducing network construction costs.

- **High power**

  The advanced power amplification technology of the AAU5639w achieves a maximum of 240 W power.

  The AAU adopts the industry-leading power amplification technology, Huawei-developed IF and RF chip, and Huawei's unique antenna element technology. Therefore, it features ultra-high power to provide a wider signal coverage area.

## High Integration

- **Light weight and small size**

  The AAU5639w integrates the functions of antennas and RF modules. Its weight and dimensions are much lighter and smaller than those of the traditional RRU+antenna solution.

- **Small frontal area**

  The frontal area of the AAU5639w is smaller than that of a common antenna.

- **Flexible deployment**

  The integrated design of the AAU5639w saves the jumper, external combiner, and the installation space required by the RRU. This simplifies the antenna installation platform

and enables flexible deployment. Its support for 3D beamforming and tilt adjustment reduces requirements on the antenna mounting height and facilitates installation.

# 3 AAU5639w Description

This section describes the exterior, functions, ports, indicators, and version differences of an AAU.

3.1 AAU Exterior

This section describes AAU exteriors.

3.2 AAU Functions

An AAU integrates the antenna and RF unit. Its main function modules include the antenna unit (AU), radio unit (RU), power module, and L1 (physical layer) processing unit.

3.3 AAU Ports and Indicators

This section describes the physical ports and indicators on an AAU.

3.4 Version Differences

This section describes the application differences of the AAU5639w in different versions.

## 3.1 AAU Exterior

This section describes AAU exteriors.

Figure 3-1 and Figure 3-2 show AAU exteriors.

**Figure 3-1** AAU (3.5 GHz/3.6 GHz/3.7 GHz) exterior

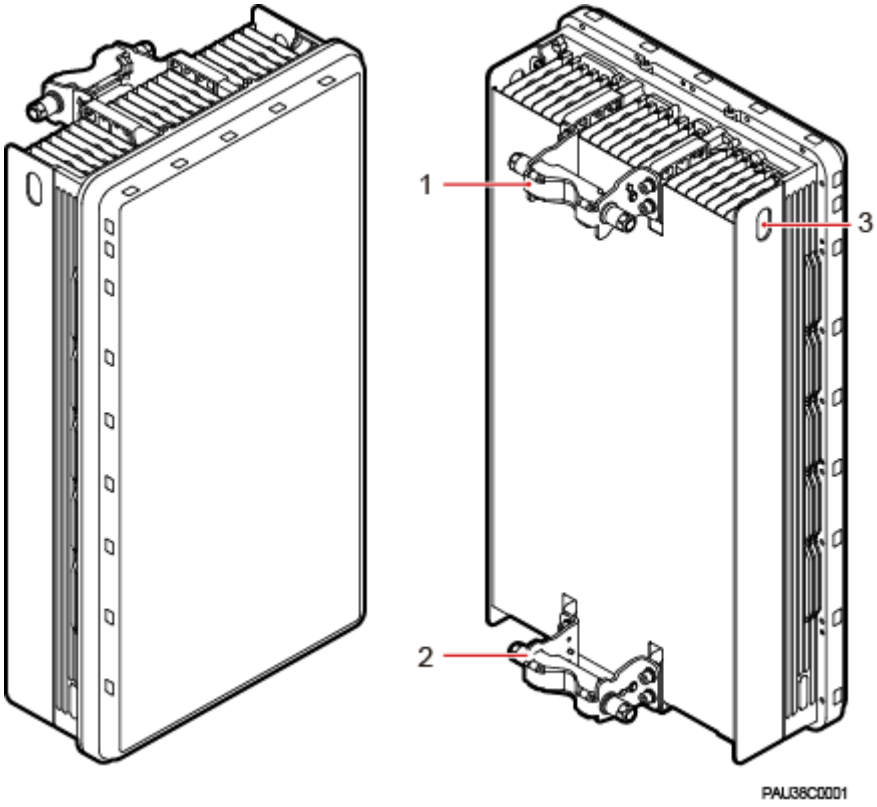
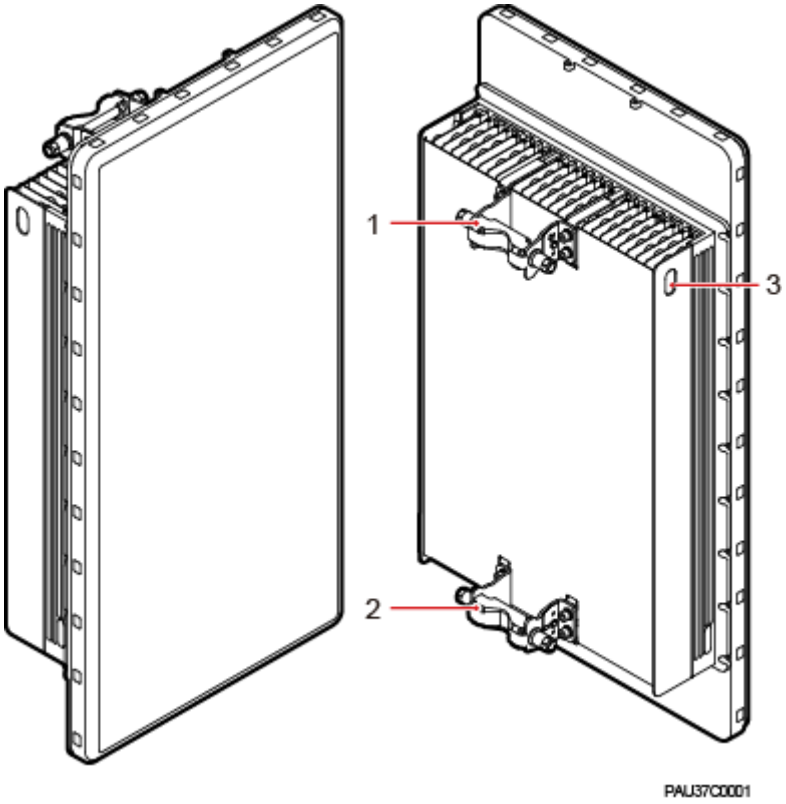


**Figure 3-2** AAU (2.6 GHz) exterior




| | | |
|---|---|---|
| (1) Mounting kit: upper handle | (2) Mounting kit: lower handle | (3) Anti-falling safety reinforcement hole |

Figure 3-3 and Figure 3-4 show AAU dimensions.

**Figure 3-3** AAU (3.5 GHz/3.6 GHz/3.7 GHz) dimensions

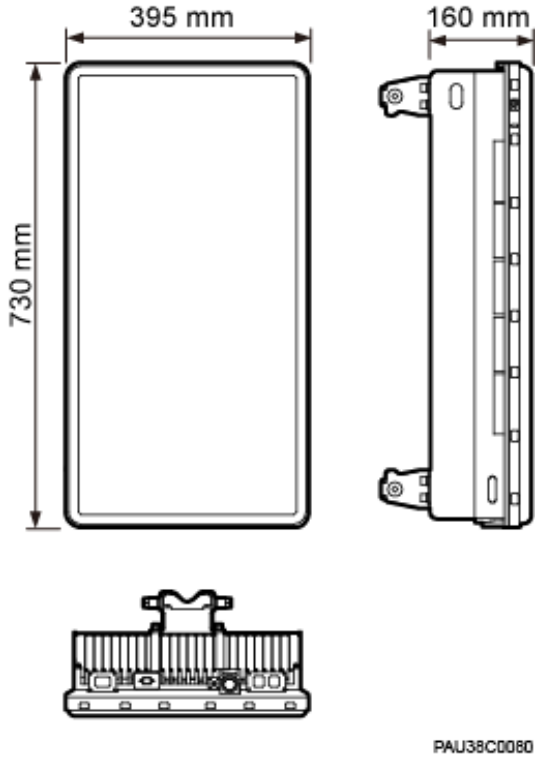
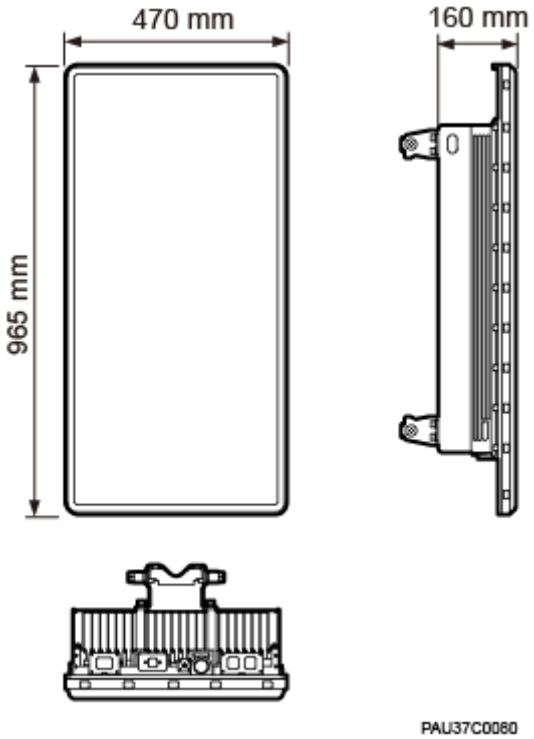



**Figure 3-4** AAU (2.6 GHz) dimensions



# 3.2 AAU Functions

An AAU integrates the antenna and RF unit. Its main function modules include the antenna unit (AU), radio unit (RU), power module, and L1 (physical layer) processing unit.

Figure 3-5 shows the AAU logical structure.

**Figure 3-5** Logical structure

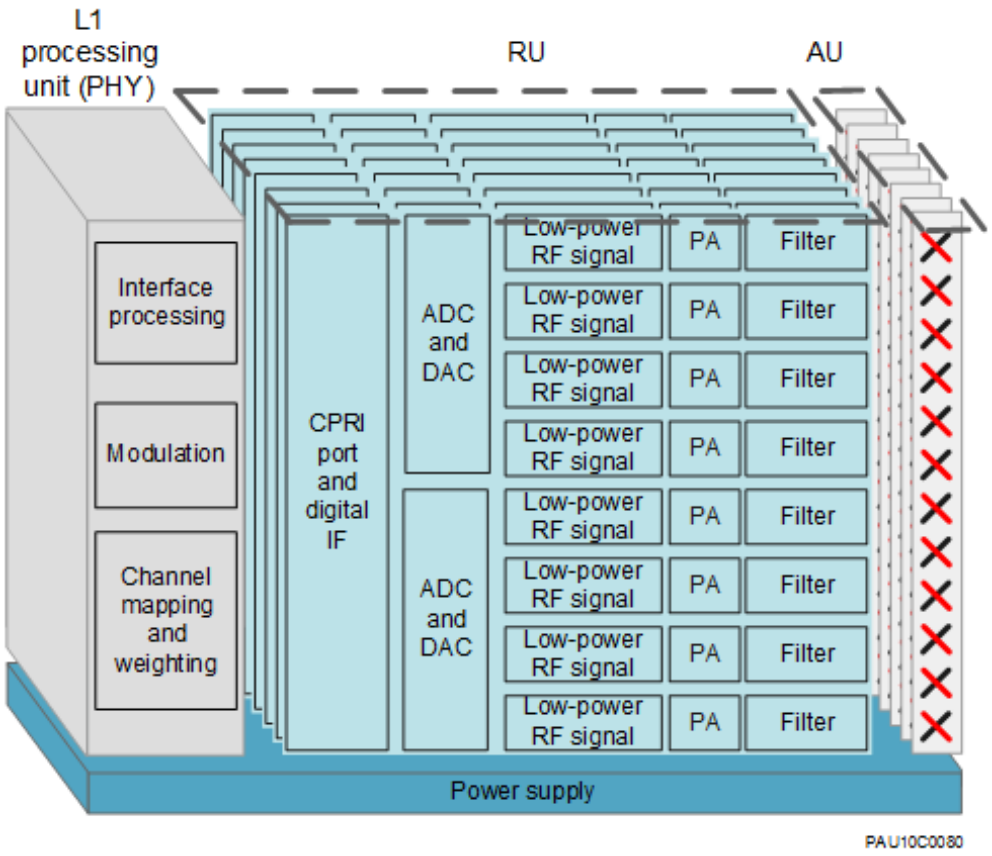



Table 3-1 describes function modules of an AAU.

**Table 3-1** Function modules of an AAU

| Function Module | Function Description |
| --- | --- |
| AU | Each antenna uses an 8x12 array and supports 96 dual-polarized elements to transmit and receive radio waves. |
| RU | The RF unit processes RF signals and performs phase correction for uplink and downlink RF channels. The related sub-function modules are as follows:<br>• CPRI port and digital intermediate frequency (IF): CPRI signal transmission and digital IF processing<br>• ADC and DAC: Analog-to-digital conversion (using the ADC) and digital-to-analog conversion (using the DAC) (ADC is short for |

| Function Module | Function Description |
| --- | --- |
| | analog-to-digital converter and DAC is short for digital-to-analog converter.)<br>• Low-power RF signal: Down-conversion and amplification for RF signals; up-conversion and amplification for analog signals<br>• Power amplifier (PA): Signal power amplification<br>• Filter: Protection and filtering |
| Power module | Supplies operating voltage to the AAU. |
| L1 processing unit | • Provides enhanced common public radio interface (eCPRI) ports to converge or distribute eCPRI signals.<br>• Implements the uplink and downlink processing at the 5G NR physical layer.<br>• Performs I/Q modulation, mapping, and digital weighting in the downlink. |

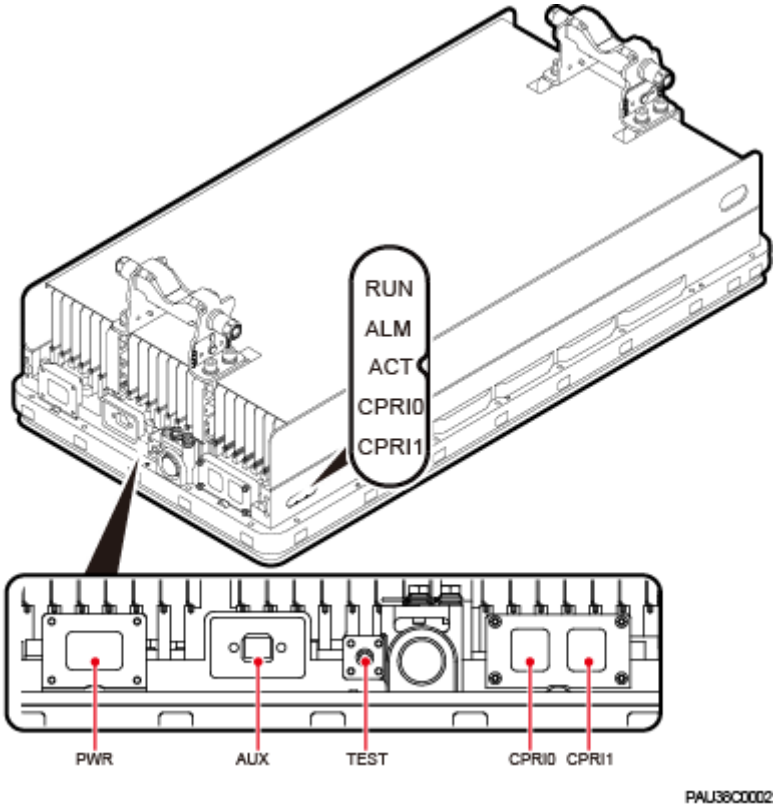
# 3.3 AAU Ports and Indicators

This section describes the physical ports and indicators on an AAU.

Figure 3-6 shows the physical ports and indicators on an AAU.

**Figure 3-6** Physical ports and indicators




## Physical Ports

Table 3-2 describes the physical ports on an AAU.

**Table 3-2** Physical ports

| Silkscreen | Connector Type | Description |
|---|---|---|
| CPRI1 | DLC connector | Optical port 1 with a data rate of 10.3125 Gbit/s or 25.78125 Gbit/s. An optical module must be inserted into the port for optical fiber installation. |
| CPRI0 | DLC connector | Optical port 0 with a data rate of 10.3125 Gbit/s or 25.78125 Gbit/s. An optical module must be inserted into the port for optical fiber installation. |
| PWR | Outdoor quick-lock power connector | –48 V DC power port |
| AUX | DB15 male connector | Port for an antenna information sensor unit (AISU) to transmit AISG signals |
| TEST | N/A | Reserved port, which is unavailable |

## Indicators

Table 3-3 describes the indicators on an AAU.

**Table 3-3** Indicators

| Silkscreen | Color | Status | Description |
|---|---|---|---|
| RUN | Green | Steady on | There is power supply, but the module is faulty. |
| | | Steady off | There is no power supply, or the module is faulty. |
| | | Blinking (on for 1s and off for 1s) | The module is working properly. |
| | | Blinking (on for 0.125s and off for 0.125s) | The module software is being loaded or the module is not working. |
| ALM | Red | Steady on | An alarm is generated, and the module must be replaced. |
| | | Blinking (on for 1s and off for 1s) | An alarm is generated. The alarm may be caused by a fault on a related module or port. Therefore, you need to locate the fault before deciding whether to replace the module. |
| | | Steady off | No alarm is generated. |
| ACT | Green | Steady on | The module is working properly when TX channels are enabled or software is being loaded to the module that is not started. |
| | | Blinking (on for 1s and off for 1s) | The module is working properly with TX channels disabled. |
| • CPRI0<br>• CPRI1 | Red or green | Steady green | The common public radio interface (CPRI) link is working properly. |
| | | Steady red | The optical module fails to transmit or receive signals (due to optical module faults, broken optical fibers, or other causes). |
| | | Blinking red (on for 1s and off for 1s) | The CPRI link is out of lock (due to a failure in clock lock between two modes, CPRI port rate mismatch, or other causes).<br>You are advised to check the system configuration to locate the fault. |
| | | Steady off | The optical module cannot be detected or is powered off. |

# 3.4 Version Differences

This section describes the application differences of the AAU5639w in different versions.

## AAU5639w (2496 MHz to 2690 MHz)

**Table 3-4** Version differences of an AAU5639w (2496 MHz to 2690 MHz)

| Version | Version Difference |
| --- | --- |
| SRAN15.1 | • In LTE TDD mode, six LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and three LTE TDD carriers are supported. |
| SRAN16.0 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and four LTE TDD carriers are supported. |
| SRAN16.1 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and five LTE TDD carriers are supported. |

## AAU5639w (3400 MHz to 3600 MHz)

**Table 3-5** Version differences of an AAU5639w (3400 MHz to 3600 MHz)

| Version | Version Difference |
| --- | --- |
| SRAN15.1 | • In LTE TDD mode, six LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and three LTE TDD carriers are supported. |
| SRAN16.0 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and four LTE TDD carriers are supported. |
| SRAN16.1 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and five LTE TDD carriers are supported. |

## AAU5639w (3420 MHz to 3600 MHz)

**Table 3-6** Version differences of an AAU5639w (3420 MHz to 3600 MHz)

| Version | Version Difference |
| --- | --- |
| SRAN15.1 | • In LTE TDD mode, six LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and three LTE TDD carriers are supported. |
| SRAN16.0 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and four LTE TDD carriers are supported. |
| SRAN16.1 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and five LTE TDD carriers are supported. |

## AAU5639w (3450 MHz to 3700 MHz)

**Table 3-7** Version differences of an AAU5639w (3450 MHz to 3700 MHz)

| Version | Version Difference |
| --- | --- |
| SRAN15.1 | • In LTE TDD mode, six LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and three LTE TDD carriers are supported. |
| SRAN16.0 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and four LTE TDD carriers are supported. |
| SRAN16.1 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and five LTE TDD carriers are supported. |

## AAU5639w (3600 MHz to 3800 MHz)

**Table 3-8** Version differences of an AAU5639w (3600 MHz to 3800 MHz)

| Version | Version Difference |
| --- | --- |
| SRAN15.1 | • In LTE TDD mode, six LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and three LTE TDD carriers are supported. |
| SRAN16.0 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and four LTE TDD carriers are supported. |

| Version | Version Difference |
| --- | --- |
| SRAN16.1 | • In LTE TDD mode, eight LTE TDD carriers are supported.<br>• In TN (TDD) mode, one NR TDD carrier and five LTE TDD carriers are supported. |

# 4 AAU5639w (2600 MHz) Technical Specifications

The technical specifications of an AAU5639w (2600 MHz) include RF specifications, antenna specifications, receiver sensitivity, engineering specifications, and CPRI port specifications.



## 4.1 AAU5639w (2600 MHz) RF Specifications

The RF specifications include radio access technologies (RATs), frequency bands, TX/RX modes, capacity, and output power.

- Unless otherwise specified, in the following, **LTE** and **eNodeB** always include LTE FDD, LTE TDD, and LTE NB-IoT. In scenarios where they need to be distinguished, **LTE FDD**, **LTE TDD**, and **LTE NB-IoT** are used. The same rules apply to eNodeB.
- Unless otherwise specified, in the following, **NR** and **gNodeB** always include FDD and TDD. In scenarios where they need to be distinguished, **NR FDD** and **NR TDD** are used. The same rules apply to gNodeB.
- In the following, **G** is short for **GSM**, **U** is short for **UMTS**, **L** is short for **LTE FDD**, **T** is short for **LTE TDD**, **M** is short for **LTE NB-IoT**, **N** is short for **NR**, **N (FDD)** is short for **NR FDD**, and **N (TDD)** is short for **NR TDD**.

## Supported Frequency Bands and RATs

**Table 4-1** Frequency bands and RATs supported by an AAU5639w (2600 MHz)

| Frequency Band (MHz) | Protocol-defined Band | Frequency Range (MHz) | RAT | IBW (MHz) | OBW (MHz) |
|---|---|---|---|---|---|
| 2600 | Band 41/n41 | 2496 to 2690 | LTE TDD, NR TDD, TN (TDD) | 194 | 194 |

## TX/RX Modes and Capacity

**Table 4-2** TX/RX modes and capacity of an AAU5639w (2600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | TX/RX Mode | Capacity | Supported Bandwidth (MHz) |
|---|---|---|---|---|
| 2600 | 2496 to 2690 | 64T64R | LTE TDD: 8 carriers<br>NR TDD: 2 carriers<br>TN (TDD): 1 NR TDD carrier and 5 LTE TDD carriers | LTE TDD: 10/15/20<br>NR TDD: 20/40/50/60/70/80/90/100 |

## Output Power and Carrier Configurations

**Table 4-3** Output power and carrier configurations of an AAU5639w (2600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Maximum Output Power | Output Power Configuration |
|---|---|---|---|
| 2600 | 2496 to 2690 | 240 W | For typical configurations, see Typical Power Configuration Reference for AAU Modules. |

NOTE

- Each **Output Power per Carrier (W)** value in the *Typical Power Configuration Reference for AAU Modules* document indicates the maximum output power of each carrier under the corresponding configuration while ensuring the network performance. The actually configured carrier power of RF modules can be less than or equal to the value of **Output Power per Carrier (W)** in the document. The power configuration that is not supported in the document may be configurable on the software. Huawei can only promise the performance with the power configurations listed in the document.

## RF Compliance Standards

**Table 4-4** RF compliance standards for an AAU5639w (2600 MHz)

| Item | Standard |
| --- | --- |
| LTE standard | 3GPP TS 36.104 |
| NR standard | 3GPP TS 38.104 |

# 4.2 AAU5639w (2600 MHz) Antenna Specifications

The antenna specifications include the frequency range, gains, and beam range of the antenna.

## Antenna Specifications

**Table 4-5** Antenna electrical specifications of an AAU5639w (2600 MHz)

| Item | Specifications |
| --- | --- |
| **Frequency Range (MHz)** | **2496 to 2690** |
| Polarization mode (°) | +45 and -45 |
| NR TDD gain (dBi) | 24.8 |
| NR TDD horizontal beam sweeping range (°) | -60 to +60 |
| NR TDD vertical beam sweeping range (°) | -15 to +15 |
| LTE TDD traffic beam gain (dBi) | 24.8 |
| LTE TDD broadcast beam gain (dBi)[a] | 17.5 |
| Horizontal half-power beamwidth of the LTE TDD broadcast beam (°) | 65±5 |
| Vertical half-power beamwidth of the LTE TDD broadcast beam (°) | ≥ 5.5 |
| Number of antenna elements | 192 |
| a: The gain is obtained in macro coverage scenarios with the horizontal beamwidth of 65°. | |

# 4.3 AAU5639w (2600 MHz) Receiver Sensitivity

The receiver sensitivity of an AAU measures the capability of the AAU to receive signals with the minimum power.

**Table 4-6** Receiver sensitivity of an AAU5639w (2600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Receiver Sensitivity |
| --- | --- | --- |
| 2600 | 2496 to 2690 | LTE TDD: -105 dBm<br>NR TDD: -99 dBm |

NOTE

- The LTE TDD receiver sensitivity is measured with the ambient temperature of 25°C (77°F) and test configurations (QPSK, R = 1/3, 25 RBs) recommended in 3GPP TS 36.141.
- The NR TDD receiver sensitivity is measured with the ambient temperature of 25°C (77°F) and test configurations (QPSK, R = 1/3, 51 RBs) recommended in 3GPP TS 38.141.

# 4.4 AAU5639w (2600 MHz) Engineering Specifications

The engineering specifications include the dimensions, weight, input power, module power consumption, and environmental specifications.

## Input Power

**Table 4-7** Input power of an AAU5639w (2600 MHz)

| Power Supply Type | Operating Voltage |
| --- | --- |
| -48 V DC | -36 V DC to -63 V DC |

## Module Power Consumption

**Table 4-8** Power consumption of an AAU5639w (2600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Typical Power Consumption (W)[a] |
| --- | --- | --- |
| 2600 | 2496 to 2690 | 780 |
| a: The typical power consumption of an RF module is measured when the ambient temperature is 25°C (77°F) and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value. | | |

## Dimensions and Weight

**Table 4-9** Dimensions and weight of an AAU5639w (2600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Dimensions (H x W x D) | Weight |
|---|---|---|---|
| 2600 | 2496 to 2690 | 965 mm x 470 mm x 160 mm (37.99 in. x 18.50 in. x 6.30 in.) | 35 kg (77.18 lb, excluding mounting kits) |

## Environmental Specifications

**Table 4-10** Environmental specifications of an AAU5639w (2600 MHz)

| Item | Specifications |
|---|---|
| Operating temperature | Without solar radiation: -40°C to +55°C (-40°F to +131°F) |
| Wind load (Assume that the wind speed is 150 km/h.) | • Front: 660 N<br>• Side: 165 N |
| Operating wind speed | 150 km/h |
| Survival wind speed | 200 km/h |
| Relative humidity | 5% RH to 100% RH |
| Atmospheric pressure | 70 kPa to 106 kPa |

NOTE

The output power of an AAU temporarily decreases when it operates at temperature ranges 10°C (50°F) less than or equal to its maximum rated value. This is dependent on installation scenario, traffic load, and carrier configuration.

**Table 4-11** Surge protection specifications of ports

| Port | Surge Protection Mode | Surge Protection Specifications |
|---|---|---|
| Power port | Surge current | 20 kA |

NOTE

- Unless otherwise specified, the lightning protection specifications depend on the surge waveform of 8/20 μs.

- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

## Compliance Standards

**Table 4-12** Compliance standards for an AAU5639w (2600 MHz)

| Item | Standard |
| --- | --- |
| Operating environment | ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations" |
| Storage environment[a] | ETSI EN 300019-1-1 V2.1.4 (2003-04) Class 1.2 "Weatherprotected, not temperature-controlled storage locations" |
| Shockproof protection | Interim Provisions for Test of Anti-seismic Performances of Telecommunications Equipment |
| Ingress protection rating | IP65 |
| Surge protection | • IEC 62305-1 Protection against lightning - Part 1: General principles<br>• IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard<br>• IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures<br>• ITU-T K.35 Bonding configurations and earthing at remote electronic sites<br>• ITU-T K.56 Protection of radio base stations against lightning discharges<br>• ITU-T K.97 Lightning protection of distributed base stations<br>• ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers<br>• YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations<br>• GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations) |
| a: The validity period is one year. The product can function properly within the validity period if the storage environment meets the preceding standards. | |

# 4.5 AAU5639w (2600 MHz) CPRI Port Specifications

The CPRI port specifications of an AAU include the CPRI port protocol, rate, and maximum level of cascading and maximum distance with a BBU.

**Table 4-13** CPRI port protocol and rate of an AAU5639w (2600 MHz)

| Number of CPRI Ports | Protocol Type | Port Rate (Gbit/s) |
|---|---|---|
| 2 | eCPRI | 10.3125/25.78125 |

**Table 4-14** Maximum level of cascading and maximum distance between an AAU5639w (2600 MHz) and a BBU

| Module | Maximum Level of Cascading with a BBU | Maximum Distance from a BBU |
|---|---|---|
| AAU5639w | Not supported | • 25 Gbit/s optical module: 10 km (6.21 mi.)<br>• 10 Gbit/s optical module: 20 km (12.43 mi.) |

# 5 AAU5639w (3500 MHz) Technical Specifications

The technical specifications of an AAU5639w (3500 MHz) include RF specifications, antenna specifications, receiver sensitivity, engineering specifications, and CPRI port specifications.



## 5.1 AAU5639w (3500 MHz) RF Specifications

The RF specifications include radio access technologies (RATs), frequency bands, TX/RX modes, capacity, and output power.

- Unless otherwise specified, in the following, **LTE** and **eNodeB** always include LTE FDD, LTE TDD, and LTE NB-IoT. In scenarios where they need to be distinguished, **LTE FDD**, **LTE TDD**, and **LTE NB-IoT** are used. The same rules apply to eNodeB.
- Unless otherwise specified, in the following, **NR** and **gNodeB** always include FDD and TDD. In scenarios where they need to be distinguished, **NR FDD** and **NR TDD** are used. The same rules apply to gNodeB.
- In the following, **G** is short for **GSM**, **U** is short for **UMTS**, **L** is short for **LTE FDD**, **T** is short for **LTE TDD**, **M** is short for **LTE NB-IoT**, **N** is short for **NR**, **N (FDD)** is short for **NR FDD**, and **N (TDD)** is short for **NR TDD**.

## Supported Frequency Bands and RATs

**Table 5-1** Frequency bands and RATs supported by an AAU5639w (3500 MHz)

| Frequency Band (MHz) | Protocol-defined Band | Frequency Range (MHz) | RAT | IBW (MHz) | OBW (MHz) |
|---|---|---|---|---|---|
| 3500 | Band 42/n78 | 3400 to 3600 | LTE TDD, NR TDD, TN (TDD) | 200 | 200 |
| 3500 | Band 42/n78 | 3420 to 3600 | LTE TDD, NR TDD, TN (TDD) | 180 | 180 |

## TX/RX Modes and Capacity

**Table 5-2** TX/RX modes and capacity of an AAU5639w (3500 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | TX/RX Mode | Capacity | Supported Bandwidth (MHz) |
|---|---|---|---|---|
| 3500 | 3400 to 3600 | 64T64R | LTE TDD: 8 carriers<br>NR TDD: 2 carriers<br>TN (TDD): 1 NR TDD carrier and 5 LTE TDD carriers | LTE TDD: 10/15/20<br>NR TDD: 20/30/40/50/60/70/80/90/100 |
| 3500 | 3420 to 3600 | 64T64R | LTE TDD: 8 carriers<br>NR TDD: 2 carriers<br>TN (TDD): 1 NR TDD carrier and 5 LTE TDD carriers | LTE TDD: 10/15/20<br>NR TDD: 20/30/40/50/60/70/80/90/100 |

NOTE

Capacity specifications vary with the software version. For details, see "Version Differences" or *Typical Power Configuration Reference for AAU Modules*.

## Output Power and Carrier Configurations

**Table 5-3** Output power and carrier configurations of an AAU5639w (3500 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Maximum Output Power | Output Power Configuration |
|---|---|---|---|
| 3500 | 3400 to | 240 W | For typical configurations, see Typical |

| Frequency Band (MHz) | Frequency Range (MHz) | Maximum Output Power | Output Power Configuration |
|---|---|---|---|
| | 3600 | | Power Configuration Reference for AAU Modules. |
| 3500 | 3420 to 3600 | 240 W | For typical configurations, see Typical Power Configuration Reference for AAU Modules. |

NOTE

- Each **Output Power per Carrier (W)** value in the *Typical Power Configuration Reference for AAU Modules* document indicates the maximum output power of each carrier under the corresponding configuration while ensuring the network performance. The actually configured carrier power of RF modules can be less than or equal to the value of **Output Power per Carrier (W)** in the document. The power configuration that is not supported in the document may be configurable on the software. Huawei can only promise the performance with the power configurations listed in the document.

## RF Compliance Standards

**Table 5-4** RF compliance standards for an AAU5639w (3500 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Item | Standard |
|---|---|---|---|
| 3500 | 3400 to 3600 | LTE standard | 3GPP TS 36.104 |
| | | NR standard | 3GPP TS 38.104 |
| 3500 | 3420 to 3600 | LTE standard | • 3GPP TS 36.104<br>• ECC |
| | | NR standard | • 3GPP TS 38.104<br>• ECC |

# 5.2 AAU5639w (3500 MHz) Antenna Specifications

The antenna specifications include the frequency range, gains, and beam range of the antenna.

## Antenna Specifications

**Table 5-5** Antenna electrical specifications of an AAU5639w (3500 MHz)

| Item | Specifications |
|---|---|
| **Frequency Range (MHz)** | **3400 to 3600/3420 to 3600** |

| Item | Specifications |
|---|---|
| **Frequency Range (MHz)** | **3400 to 3600/3420 to 3600** |
| Polarization mode (°) | +45 and -45 |
| NR TDD gain (dBi) | 25 |
| NR TDD horizontal beam sweeping range (°) | -60 to +60 |
| NR TDD vertical beam sweeping range (°) | -15 to +15 |
| LTE TDD traffic beam gain (dBi) | 25 |
| LTE TDD broadcast beam gain (dBi)[a] | 18 |
| Horizontal half-power beamwidth of the LTE TDD broadcast beam (°) | 65±5 |
| Vertical half-power beamwidth of the LTE TDD broadcast beam (°) | ≥ 5.5 |
| Number of antenna elements | 192 |
| a: The gain is obtained in macro coverage scenarios with the horizontal beamwidth of 65°. | |

# 5.3 AAU5639w (3500 MHz) Receiver Sensitivity

The receiver sensitivity of an AAU measures the capability of the AAU to receive signals with the minimum power.

**Table 5-6** Receiver sensitivity of an AAU5639w (3500 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Receiver Sensitivity |
|---|---|---|
| 3500 | 3400 to 3600 | LTE TDD: -105 dBm<br>NR TDD: -99 dBm |
| 3500 | 3420 to 3600 | LTE TDD: -105 dBm<br>NR TDD: -99 dBm |

NOTE

- The LTE TDD receiver sensitivity is measured with the ambient temperature of 25°C (77°F) and test configurations (QPSK, R = 1/3, 25 RBs) recommended in 3GPP TS 36.141.
- The NR TDD receiver sensitivity is measured with the ambient temperature of 25°C (77°F) and test configurations (QPSK, R = 1/3, 51 RBs) recommended in 3GPP TS 38.141.

# 5.4 AAU5639w (3500 MHz) Engineering Specifications

The engineering specifications include the dimensions, weight, input power, module power consumption, and environmental specifications.

## Input Power

**Table 5-7** Input power of an AAU5639w (3500 MHz)

| Power Supply Type | Operating Voltage |
|---|---|
| -48 V DC | -36 V DC to -63 V DC |

## Module Power Consumption

**Table 5-8** Power consumption of an AAU5639w (3500 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Typical Power Consumption (W)[a] |
|---|---|---|
| 3500 | 3400 to 3600 | 749 |
| 3500 | 3420 to 3600 | 750 |
| a: The typical power consumption of an RF module is measured when the ambient temperature is 25°C (77°F) and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value. | | |

## Dimensions and Weight

**Table 5-9** Dimensions and weight of an AAU5639w (3500 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Dimensions (H x W x D) | Weight |
|---|---|---|---|
| 3500 | 3400 to 3600 | 730 mm x 395 mm x 160 mm (28.74 in. x 15.55 in. x 6.30 in.) | 27 kg (59.54 lb, excluding mounting kits) |
| 3500 | 3420 to 3600 | 730 mm x 395 mm x 160 mm (28.74 in. x 15.55 in. x 6.30 in.) | 27 kg (59.54 lb, excluding mounting kits) |

## Environmental Specifications

**Table 5-10** Environmental specifications of an AAU5639w (3500 MHz)

| Item | Specifications |
|---|---|
| Operating temperature | Without solar radiation: -40°C to +55°C (-40°F to +131°F) |
| Wind load (Assume that the wind speed is 150 km/h.) | • Front: 425 N<br>• Side: 135 N |
| Operating wind speed | 150 km/h |
| Survival wind speed | 200 km/h |
| Relative humidity | 5% RH to 100% RH |
| Atmospheric pressure | 70 kPa to 106 kPa |

NOTE

The output power of an AAU temporarily decreases when it operates at temperature ranges 10°C (50°F) less than or equal to its maximum rated value. This is dependent on installation scenario, traffic load, and carrier configuration.

**Table 5-11** Surge protection specifications of ports

| Port | Surge Protection Mode | Surge Protection Specifications |
|---|---|---|
| Power port | Surge current | 20 kA |

NOTE

- Unless otherwise specified, the lightning protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

## Compliance Standards

**Table 5-12** Compliance standards for an AAU5639w (3500 MHz)

| Item | Standard |
|---|---|
| Operating environment | ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations" |
| Storage environment[a] | ETSI EN 300019-1-1 V2.1.4 (2003-04) Class 1.2 "Weatherprotected, not temperature-controlled storage locations" |

| Item | Standard |
| --- | --- |
| Shockproof protection | Interim Provisions for Test of Anti-seismic Performances of Telecommunications Equipment |
| Ingress protection rating | IP65 |
| Surge protection | • IEC 62305-1 Protection against lightning - Part 1: General principles<br>• IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard<br>• IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures<br>• ITU-T K.35 Bonding configurations and earthing at remote electronic sites<br>• ITU-T K.56 Protection of radio base stations against lightning discharges<br>• ITU-T K.97 Lightning protection of distributed base stations<br>• ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers<br>• YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations<br>• GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations) |
| a: The validity period is one year. The product can function properly within the validity period if the storage environment meets the preceding standards. | |

# 5.5 AAU5639w (3500 MHz) CPRI Port Specifications

The CPRI port specifications of an AAU include the CPRI port protocol, rate, and maximum level of cascading and maximum distance with a BBU.

**Table 5-13** CPRI port protocol and rate of an AAU5639w (3500 MHz)

| Number of CPRI Ports | Protocol Type | Port Rate (Gbit/s) |
| --- | --- | --- |
| 2 | eCPRI | 10.3125/25.78125 |

**Table 5-14** Maximum level of cascading and maximum distance between an AAU5639w (3500 MHz) and a BBU

| Module | Maximum Level of Cascading with a BBU | Maximum Distance from a BBU |
| --- | --- | --- |

| Module | Maximum Level of Cascading with a BBU | Maximum Distance from a BBU |
| --- | --- | --- |
| AAU5639w | Not supported | • 25 Gbit/s optical module: 10 km (6.21 mi.)<br>• 10 Gbit/s optical module: 20 km (12.43 mi.) |

# 6 AAU5639w (3600 MHz) Technical Specifications

The technical specifications of an AAU5639w (3600 MHz) include RF specifications, antenna specifications, receiver sensitivity, engineering specifications, and CPRI port specifications.



## 6.1 AAU5639w (3600 MHz) RF Specifications

The RF specifications include radio access technologies (RATs), frequency bands, TX/RX modes, capacity, and output power.

- Unless otherwise specified, in the following, **LTE** and **eNodeB** always include LTE FDD, LTE TDD, and LTE NB-IoT. In scenarios where they need to be distinguished, **LTE FDD**, **LTE TDD**, and **LTE NB-IoT** are used. The same rules apply to eNodeB.
- Unless otherwise specified, in the following, **NR** and **gNodeB** always include FDD and TDD. In scenarios where they need to be distinguished, **NR FDD** and **NR TDD** are used. The same rules apply to gNodeB.
- In the following, **G** is short for **GSM**, **U** is short for **UMTS**, **L** is short for **LTE FDD**, **T** is short for **LTE TDD**, **M** is short for **LTE NB-IoT**, **N** is short for **NR**, **N (FDD)** is short for **NR FDD**, and **N (TDD)** is short for **NR TDD**.

## Supported Frequency Bands and RATs

**Table 6-1** Frequency bands and RATs supported by an AAU5639w (3600 MHz)

| Frequency Band (MHz) | Protocol-defined Band | Frequency Range (MHz) | RAT | IBW (MHz) | OBW (MHz) |
|---|---|---|---|---|---|
| 3600 | Band 42, Band 43/n78 | 3450 to 3700 | LTE TDD, NR TDD, TN (TDD) | 200 | 200 |

## TX/RX Modes and Capacity

**Table 6-2** TX/RX modes and capacity of an AAU5639w (3600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | TX/RX Mode | Capacity | Supported Bandwidth (MHz) |
|---|---|---|---|---|
| 3600 | 3450 to 3700 | 64T64R | LTE TDD: 8 carriers<br>NR TDD: 2 carriers<br>TN (TDD): 1 NR TDD carrier and 5 LTE TDD carriers | LTE TDD: 10/15/20<br>NR TDD: 20/30/40/50/60/70/80/90/100 |

NOTE

Capacity specifications vary with the software version. For details, see "Version Differences" or *Typical Power Configuration Reference for AAU Modules*.

## Output Power and Carrier Configurations

**Table 6-3** Output power and carrier configurations of an AAU5639w (3600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Maximum Output Power | Output Power Configuration |
|---|---|---|---|
| 3600 | 3450 to 3700 | 240 W | For typical configurations, see Typical Power Configuration Reference for AAU Modules. |

NOTE

- Each **Output Power per Carrier (W)** value in the *Typical Power Configuration Reference for AAU Modules* document indicates the maximum output power of each carrier under the corresponding configuration while ensuring the network performance. The actually configured carrier power of RF modules can be less than or equal to the value of **Output Power per Carrier (W)** in the document. The power configuration that is not supported in the document may be configurable on the software. Huawei can only promise the performance with the power configurations listed in the document.

## RF Compliance Standards

**Table 6-4** RF compliance standards for an AAU5639w (3600 MHz)

| Item | Standard |
| --- | --- |
| LTE standard | 3GPP TS 36.104 |
| NR standard | 3GPP TS 38.104 |

# 6.2 AAU5639w (3600 MHz) Antenna Specifications

The antenna specifications include the frequency range, gains, and beam range of the antenna.

## Antenna Specifications

**Table 6-5** Antenna electrical specifications of an AAU5639w (3600 MHz)

| Item | Specifications |
| --- | --- |
| **Frequency Range (MHz)** | **3450 to 3700** |
| Polarization mode (°) | +45 and -45 |
| NR TDD gain (dBi) | 25 |
| NR TDD horizontal beam sweeping range (°) | -60 to +60 |
| NR TDD vertical beam sweeping range (°) | -15 to +15 |
| LTE TDD traffic beam gain (dBi) | 25 |
| LTE TDD broadcast beam gain (dBi)[a] | 18 |
| Horizontal half-power beamwidth of the LTE TDD broadcast beam (°) | 65±5 |
| Vertical half-power beamwidth of the LTE TDD broadcast beam (°) | ≥ 5.5 |
| Number of antenna elements | 192 |

| Item | Specifications |
| --- | --- |
| **Frequency Range (MHz)** | **3450 to 3700** |
| a: The gain is obtained in macro coverage scenarios with the horizontal beamwidth of 65°. | |

# 6.3 AAU5639w (3600 MHz) Receiver Sensitivity

The receiver sensitivity of an AAU measures the capability of the AAU to receive signals with the minimum power.

**Table 6-6** Receiver sensitivity of an AAU5639w (3600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Receiver Sensitivity |
| --- | --- | --- |
| 3600 | 3450 to 3700 | LTE TDD: -105 dBm<br>NR TDD: -99 dBm |

NOTE

- The LTE TDD receiver sensitivity is measured with the ambient temperature of 25°C (77°F) and test configurations (QPSK, R = 1/3, 25 RBs) recommended in 3GPP TS 36.141.
- The NR TDD receiver sensitivity is measured with the ambient temperature of 25°C (77°F) and test configurations (QPSK, R = 1/3, 51 RBs) recommended in 3GPP TS 38.141.

# 6.4 AAU5639w (3600 MHz) Engineering Specifications

The engineering specifications include the dimensions, weight, input power, module power consumption, and environmental specifications.

## Input Power

**Table 6-7** Input power of an AAU5639w (3600 MHz)

| Power Supply Type | Operating Voltage |
| --- | --- |
| -48 V DC | -36 V DC to -63 V DC |

## Module Power Consumption

**Table 6-8** Power consumption of an AAU5639w (3600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Typical Power Consumption (W)[a] |
|---|---|---|
| 3600 | 3450 to 3700 | 800 |
| a: The typical power consumption of an RF module is measured when the ambient temperature is 25°C (77°F) and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value. | | |

## Dimensions and Weight

**Table 6-9** Dimensions and weight of an AAU5639w (3600 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Dimensions (H x W x D) | Weight |
|---|---|---|---|
| 3600 | 3450 to 3700 | 730 mm x 395 mm x 190 mm (28.74 in. x 15.55 in. x 7.48 in.) | 32 kg (70.56 lb, excluding mounting kits) |

## Environmental Specifications

**Table 6-10** Environmental specifications of an AAU5639w (3600 MHz)

| Item | Specifications |
|---|---|
| Operating temperature | Without solar radiation: -40°C to +55°C (-40°F to +131°F) |
| Wind load (Assume that the wind speed is 150 km/h.) | • Front: 435 N<br>• Side: 170 N |
| Operating wind speed | 150 km/h |
| Survival wind speed | 200 km/h |
| Relative humidity | 5% RH to 100% RH |
| Atmospheric pressure | 70 kPa to 106 kPa |

NOTE

The output power of an AAU temporarily decreases when it operates at temperature ranges 10°C (50°F) less than or equal to its maximum rated value. This is dependent on installation scenario, traffic load, and carrier configuration.

**Table 6-11** Surge protection specifications of ports

| Port | Surge Protection Mode | Surge Protection Specifications |
|---|---|---|
| Power port | Surge current | 20 kA |

NOTE

- Unless otherwise specified, the lightning protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

## Compliance Standards

**Table 6-12** Compliance standards for an AAU5639w (3600 MHz)

| Item | Standard |
|---|---|
| Operating environment | ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations" |
| Storage environment[a] | ETSI EN 300019-1-1 V2.1.4 (2003-04) Class 1.2 "Weatherprotected, not temperature-controlled storage locations" |
| Shockproof protection | Interim Provisions for Test of Anti-seismic Performances of Telecommunications Equipment |
| Ingress protection rating | IP65 |
| Surge protection | • IEC 62305-1 Protection against lightning - Part 1: General principles<br>• IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard<br>• IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures<br>• ITU-T K.35 Bonding configurations and earthing at remote electronic sites<br>• ITU-T K.56 Protection of radio base stations against lightning discharges<br>• ITU-T K.97 Lightning protection of distributed base stations<br>• ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers<br>• YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations |

| Item | Standard |
| --- | --- |
| | • GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations) |
| a: The validity period is one year. The product can function properly within the validity period if the storage environment meets the preceding standards. | |

# 6.5 AAU5639w (3600 MHz) CPRI Port Specifications

The CPRI port specifications of an AAU include the CPRI port protocol, rate, and maximum level of cascading and maximum distance with a BBU.

**Table 6-13** CPRI port protocol and rate of an AAU5639w (3600 MHz)

| Number of CPRI Ports | Protocol Type | Port Rate (Gbit/s) |
| --- | --- | --- |
| 2 | eCPRI | 10.3125/25.78125 |

**Table 6-14** Maximum level of cascading and maximum distance between an AAU5639w (3600 MHz) and a BBU

| Module | Maximum Level of Cascading with a BBU | Maximum Distance from a BBU |
| --- | --- | --- |
| AAU5639w | Not supported | • 25 Gbit/s optical module: 10 km (6.21 mi.)<br>• 10 Gbit/s optical module: 20 km (12.43 mi.) |

# 7 AAU5639w (3700 MHz) Technical Specifications

The technical specifications of an AAU5639w (3700 MHz) include RF specifications, antenna specifications, receiver sensitivity, engineering specifications, and CPRI port specifications.



The RF specifications include radio access technologies (RATs), frequency bands, TX/RX modes, capacity, and output power.



The antenna specifications include the frequency range, gains, and beam range of the antenna.



The receiver sensitivity of an AAU measures the capability of the AAU to receive signals with the minimum power.



The engineering specifications include the dimensions, weight, input power, module power consumption, and environmental specifications.



## 7.1 AAU5639w (3700 MHz) RF Specifications

The RF specifications include radio access technologies (RATs), frequency bands, TX/RX modes, capacity, and output power.

- Unless otherwise specified, in the following, **LTE** and **eNodeB** always include LTE FDD, LTE TDD, and LTE NB-IoT. In scenarios where they need to be distinguished, **LTE FDD**, **LTE TDD**, and **LTE NB-IoT** are used. The same rules apply to eNodeB.
- Unless otherwise specified, in the following, **NR** and **gNodeB** always include FDD and TDD. In scenarios where they need to be distinguished, **NR FDD** and **NR TDD** are used. The same rules apply to gNodeB.
- In the following, **G** is short for **GSM**, **U** is short for **UMTS**, **L** is short for **LTE FDD**, **T** is short for **LTE TDD**, **M** is short for **LTE NB-IoT**, **N** is short for **NR**, **N (FDD)** is short for **NR FDD**, and **N (TDD)** is short for **NR TDD**.

## Supported Frequency Bands and RATs

**Table 7-1** Frequency bands and RATs supported by an AAU5639w (3700 MHz)

| Frequency Band (MHz) | Protocol-defined Band | Frequency Range (MHz) | RAT | IBW (MHz) | OBW (MHz) |
|---|---|---|---|---|---|
| 3700 | Band 43/n78 | 3600 to 3800 | LTE TDD, NR TDD, TN (TDD) | 200 | 200 |

## TX/RX Modes and Capacity

**Table 7-2** TX/RX modes and capacity of an AAU5639w (3700 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | TX/RX Mode | Capacity | Supported Bandwidth (MHz) |
|---|---|---|---|---|
| 3700 | 3600 to 3800 | 64T64R | LTE TDD: 8 carriers<br>NR TDD: 2 carriers<br>TN (TDD): 1 NR TDD carrier and 5 LTE TDD carriers | LTE TDD: 10/15/20<br>NR TDD: 20/30/40/50/60/70/80/90/100 |

NOTE

Capacity specifications vary with the software version. For details, see "Version Differences" or *Typical Power Configuration Reference for AAU Modules*.

## Output Power and Carrier Configurations

**Table 7-3** Output power and carrier configurations of an AAU5639w (3700 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Maximum Output Power | Output Power Configuration |
|---|---|---|---|
| 3700 | 3600 to 3800 | 240 W | For typical configurations, see Typical Power Configuration Reference for AAU Modules. |

NOTE

- Each **Output Power per Carrier (W)** value in the *Typical Power Configuration Reference for AAU Modules* document indicates the maximum output power of each carrier under the corresponding configuration while ensuring the network performance. The actually configured carrier power of RF modules can be less than or equal to the value of **Output Power per Carrier (W)** in the document. The power configuration that is not supported in the document may be configurable on the software. Huawei can only promise the performance with the power configurations listed in the document.

## RF Compliance Standards

**Table 7-4** RF compliance standards for an AAU5639w (3700 MHz)

| Item | Standard |
| --- | --- |
| LTE standard | 3GPP TS 36.104 |
| NR standard | 3GPP TS 38.104 |

# 7.2 AAU5639w (3700 MHz) Antenna Specifications

The antenna specifications include the frequency range, gains, and beam range of the antenna.

## Antenna Specifications

**Table 7-5** Antenna electrical specifications of an AAU5639w (3700 MHz)

| Item | Specifications |
| --- | --- |
| **Frequency Range (MHz)** | **3600 to 3800** |
| Polarization mode (°) | +45 and -45 |
| NR TDD gain (dBi) | 25 |
| NR TDD horizontal beam sweeping range (°) | -60 to +60 |
| NR TDD vertical beam sweeping range (°) | -15 to +15 |
| LTE TDD traffic beam gain (dBi) | 25 |
| LTE TDD broadcast beam gain (dBi)[a] | 18 |
| Horizontal half-power beamwidth of the LTE TDD broadcast beam (°) | 65±5 |
| Vertical half-power beamwidth of the LTE TDD broadcast beam (°) | ≥ 5.5 |
| Number of antenna elements | 192 |

| Item | Specifications |
| --- | --- |
| **Frequency Range (MHz)** | **3600 to 3800** |
| a: The gain is obtained in macro coverage scenarios with the horizontal beamwidth of 65°. | |

# 7.3 AAU5639w (3700 MHz) Receiver Sensitivity

The receiver sensitivity of an AAU measures the capability of the AAU to receive signals with the minimum power.

**Table 7-6** Receiver sensitivity of an AAU5639w (3700 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Receiver Sensitivity |
| --- | --- | --- |
| 3700 | 3600 to 3800 | LTE TDD: -105 dBm<br>NR TDD: -99 dBm |

NOTE

- The LTE TDD receiver sensitivity is measured with the ambient temperature of 25°C (77°F) and test configurations (QPSK, R = 1/3, 25 RBs) recommended in 3GPP TS 36.141.
- The NR TDD receiver sensitivity is measured with the ambient temperature of 25°C (77°F) and test configurations (QPSK, R = 1/3, 51 RBs) recommended in 3GPP TS 38.141.

# 7.4 AAU5639w (3700 MHz) Engineering Specifications

The engineering specifications include the dimensions, weight, input power, module power consumption, and environmental specifications.

## Input Power

**Table 7-7** Input power of an AAU5639w (3700 MHz)

| Power Supply Type | Operating Voltage |
| --- | --- |
| -48 V DC | -36 V DC to -63 V DC |

## Module Power Consumption

**Table 7-8** Power consumption of an AAU5639w (3700 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Typical Power Consumption (W)[a] |
|---|---|---|
| 3700 | 3600 to 3800 | 784 |
| a: The typical power consumption of an RF module is measured when the ambient temperature is 25°C (77°F) and the traffic load reaches 50%. The actual power consumption has a 10% deviation from this value. | | |

## Dimensions and Weight

**Table 7-9** Dimensions and weight of an AAU5639w (3700 MHz)

| Frequency Band (MHz) | Frequency Range (MHz) | Dimensions (H x W x D) | Weight |
|---|---|---|---|
| 3700 | 3600 to 3800 | 730 mm x 395 mm x 160 mm (28.74 in. x 15.55 in. x 6.30 in.) | 27 kg (59.54 lb, excluding mounting kits) |

## Environmental Specifications

**Table 7-10** Environmental specifications of an AAU5639w (3700 MHz)

| Item | Specifications |
|---|---|
| Operating temperature | Without solar radiation: -40°C to +55°C (-40°F to +131°F) |
| Wind load (Assume that the wind speed is 150 km/h.) | • Front: 425 N<br>• Side: 135 N |
| Operating wind speed | 150 km/h |
| Survival wind speed | 200 km/h |
| Relative humidity | 5% RH to 100% RH |
| Atmospheric pressure | 70 kPa to 106 kPa |

NOTE

The output power of an AAU temporarily decreases when it operates at temperature ranges 10°C (50°F) less than or equal to its maximum rated value. This is dependent on installation scenario, traffic load, and carrier configuration.

**Table 7-11** Surge protection specifications of ports

| Port | Surge Protection Mode | Surge Protection Specifications |
|---|---|---|
| Power port | Surge current | 20 kA |

NOTE

- Unless otherwise specified, the lightning protection specifications depend on the surge waveform of 8/20 μs.
- All the surge current items, unless otherwise specified as **Maximum discharge current**, refer to **Nominal discharge current**.

## Compliance Standards

**Table 7-12** Compliance standards for an AAU5639w (3700 MHz)

| Item | Standard |
|---|---|
| Operating environment | ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weatherprotected locations" |
| Storage environment[a] | ETSI EN 300019-1-1 V2.1.4 (2003-04) Class 1.2 "Weatherprotected, not temperature-controlled storage locations" |
| Shockproof protection | Interim Provisions for Test of Anti-seismic Performances of Telecommunications Equipment |
| Ingress protection rating | IP65 |
| Surge protection | • IEC 62305-1 Protection against lightning - Part 1: General principles<br>• IEC 62305-3 Protection against lightning - Part 3: Physical damage to structures and life hazard<br>• IEC 62305-4 Protection against lightning - Part 4: Electrical and electronic systems within structures<br>• ITU-T K.35 Bonding configurations and earthing at remote electronic sites<br>• ITU-T K.56 Protection of radio base stations against lightning discharges<br>• ITU-T K.97 Lightning protection of distributed base stations<br>• ETSI EN 300 253 Environmental Engineering (EE): Earthing and bonding configuration inside telecommunications centers<br>• YD/T 2324-2011: Lightning protection requirements and test methods for radio base stations |

| Item | Standard |
| --- | --- |
| | • GB 50689-2011: Code for design of lightning protection and earthing engineering for telecommunication bureaus (stations) |
| a: The validity period is one year. The product can function properly within the validity period if the storage environment meets the preceding standards. | |

# 7.5 AAU5639w (3700 MHz) CPRI Port Specifications

The CPRI port specifications of an AAU include the CPRI port protocol, rate, and maximum level of cascading and maximum distance with a BBU.

**Table 7-13** CPRI port protocol and rate of an AAU5639w (3700 MHz)

| Number of CPRI Ports | Protocol Type | Port Rate (Gbit/s) |
| --- | --- | --- |
| 2 | eCPRI | 10.3125/25.78125 |

**Table 7-14** Maximum level of cascading and maximum distance between an AAU5639w (3700 MHz) and a BBU

| Module | Maximum Level of Cascading with a BBU | Maximum Distance from a BBU |
| --- | --- | --- |
| AAU5639w | Not supported | • 25 Gbit/s optical module: 10 km (6.21 mi.)<br>• 10 Gbit/s optical module: 20 km (12.43 mi.) |

# 8 AAU5639w Installation Overview

This section describes the mounting kits and installation scenarios of an AAU.

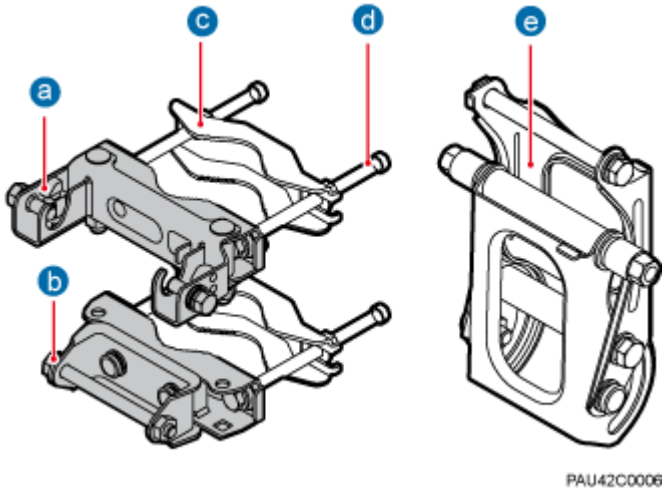


This section describes the information to be known before the AAU installation, which includes the requirements for the pole where the AAU is installed and installation clearance requirements.

## 8.1 Mounting Kits

- The default mechanical downtilt of the AAU is 0°. If a mechanical downtilt of a certain degree is required, a downtilt supporting arm needs to be configured.
- A bolt on the upper auxiliary bracket and a bolt on the lower auxiliary bracket have been pre-secured to the upper main bracket and lower main bracket before delivery, respectively.
- Figure 8-1 shows AAU mounting kits.

**Figure 8-1** Mounting kits



| No. | Component | Quantity | Description |
|---|---|---|---|
| a | Upper main bracket | 1 | Secured to the handle of the AAU. |
| b | Lower main bracket | 1 | Secured to the handle of the AAU. |
| c | Auxiliary bracket | 2 | Assembled with the main bracket for pole-mounted installation. |
| d | M10x150 bolt for pole-mounted installation | 4 | Used to assemble a main bracket with an auxiliary bracket. |
| e | Downtilt supporting arm | 1 | Secured to the handle of the AAU. It is used to adjust the mechanical downtilt. |

- The following table lists the weights of mounting kits and handles.

| Component | Weight |
|---|---|
| Upper and lower mounting kits | 2.7 kg (5.95 lb) |
| Downtilt supporting arm | 1.3 kg (2.87 lb) |
| Upper and lower handles (including attachment plates) | 1.2 kg (2.65 lb) |

# 8.2 Installation Scenarios

This section describes the information to be known before the AAU installation, which includes the requirements for the pole where the AAU is installed and installation clearance requirements.

## 8.2.1 Requirements for the Pole Where the AAU Is Installed

An AAU can be installed on a pole on the rooftop or tower.

### Restrictions

To ensure safety performance such as heat dissipation and waterproof of an AAU, the installation scenario must meet certain requirements. If the installation scenario does not meet the requirements, contact Huawei engineers for evaluation.

- An AAU cannot be installed in an enclosed camouflage box or a camouflage cover.
- An AAU cannot be installed behind a device that can generate an electromagnetic field, such as a motor.
- An AAU cannot be installed near an air vent that generates heat, such as an air conditioner air vent or chimney vent.
- An AAU can only be installed on a pole that is vertical to the ground. It cannot be installed on a diagonal pole or a horizontal pole.

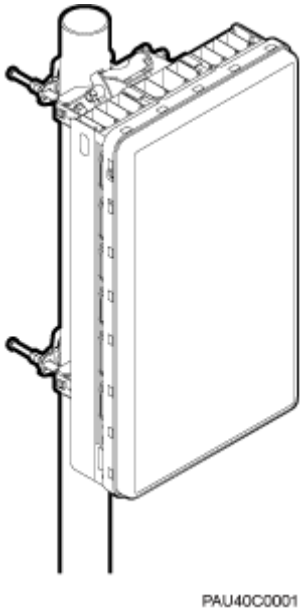
  

- In general, no further beautification (for example, coating) is allowed to avoid affecting the device performance.
- An AAU is a professional communication device and cannot be installed in areas that are easily accessible to common people. The installation scenario involves security-related features. For details about the requirements and precautions, see *Security Information*.

## Installation Scenario Description

An AAU can be installed on a pole secured on a rooftop or tower, as shown in the following figure.

**Figure 8-2** AAU installed on a pole




## Requirements for the Pole

The following table describes the requirements for the pole.

**Table 8-1** Requirements for the pole

| Installation Scenario | Pole Diameter (Φ) | Pole Wall Thickness | Pole Load Bearing Capacity | Number of AAUs | Pole Height[c] |
|---|---|---|---|---|---|
| AAU installed on the main pole[a] | 70 mm ≤ Φ ≤ 100 mm (2.76 in. ≤ Φ ≤ 3.94 in.) | 4 mm (0.16 in.) | 300 kg (661.50 lb) | 1 | ≥ 1500 mm (59.06 in.) |
| | 100 mm ≤ Φ ≤ 114 mm (3.94 in. ≤ Φ ≤ 4.49 in.) | 4 mm (0.16 in.) | 300 kg (661.50 lb) | 2 | |

| Installation Scenario | Pole Diameter (Φ) | Pole Wall Thickness | Pole Load Bearing Capacity | Number of AAUs | Pole Height[c] |
|---|---|---|---|---|---|
| AAU installed on the auxiliary pole[b] | 50 mm ≤ Φ ≤ 60 mm (1.97 in. ≤ Φ ≤ 2.36 in.) | 4 mm (0.16 in.) | 300 kg (661.50 lb) | 1 | ≥ 1000 mm (39.37 in.) |
| | 60 mm ≤ Φ ≤ 114 mm (2.36 in. ≤ Φ ≤ 4.49 in.) | 3 mm (0.12 in.) | 300 kg (661.50 lb) | 1 | |
| a: When the AAU is installed on a main pole, the bottom of the pole must be secured on a support.<br>b: When the AAU is installed on an auxiliary pole, both the pole top and bottom must be secured on the main pole or the tower.<br>c: The pole height refers to the minimum length of a pole required for installing an AAU. | | | | | |

Figure 8-3 and Figure 8-4 show AAUs installed on main poles and auxiliary poles, respectively.

**Figure 8-3** Main pole scenario

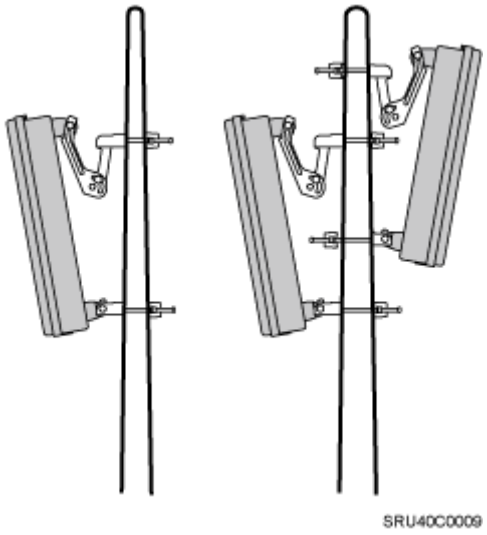
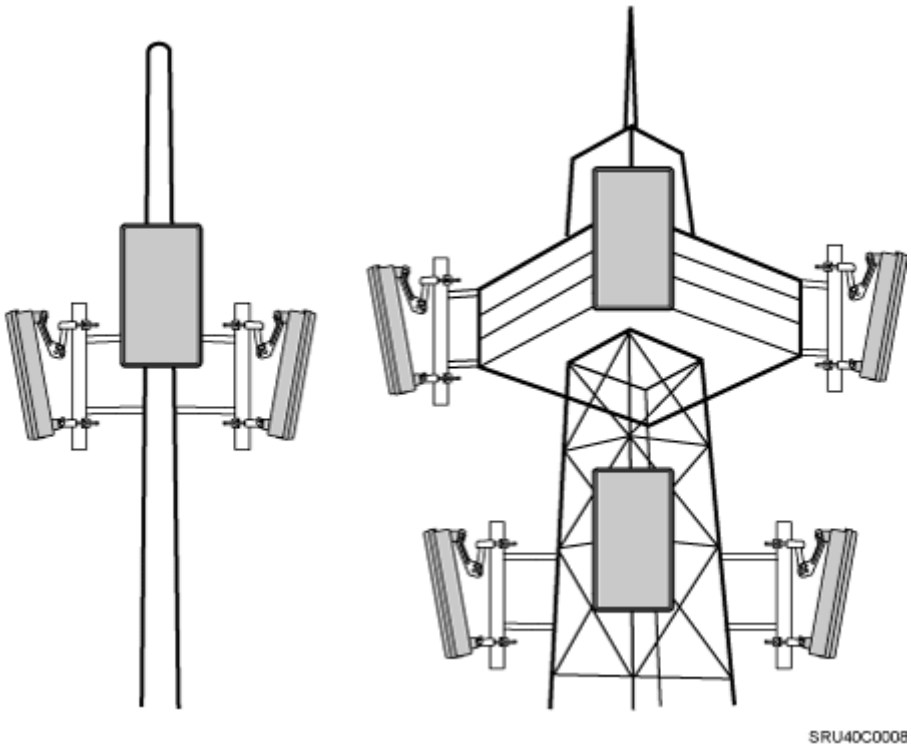


**Figure 8-4** Auxiliary pole scenario




## 8.2.2 Installation Clearance Requirements

This section describes the clearance requirements for installing an AAU.

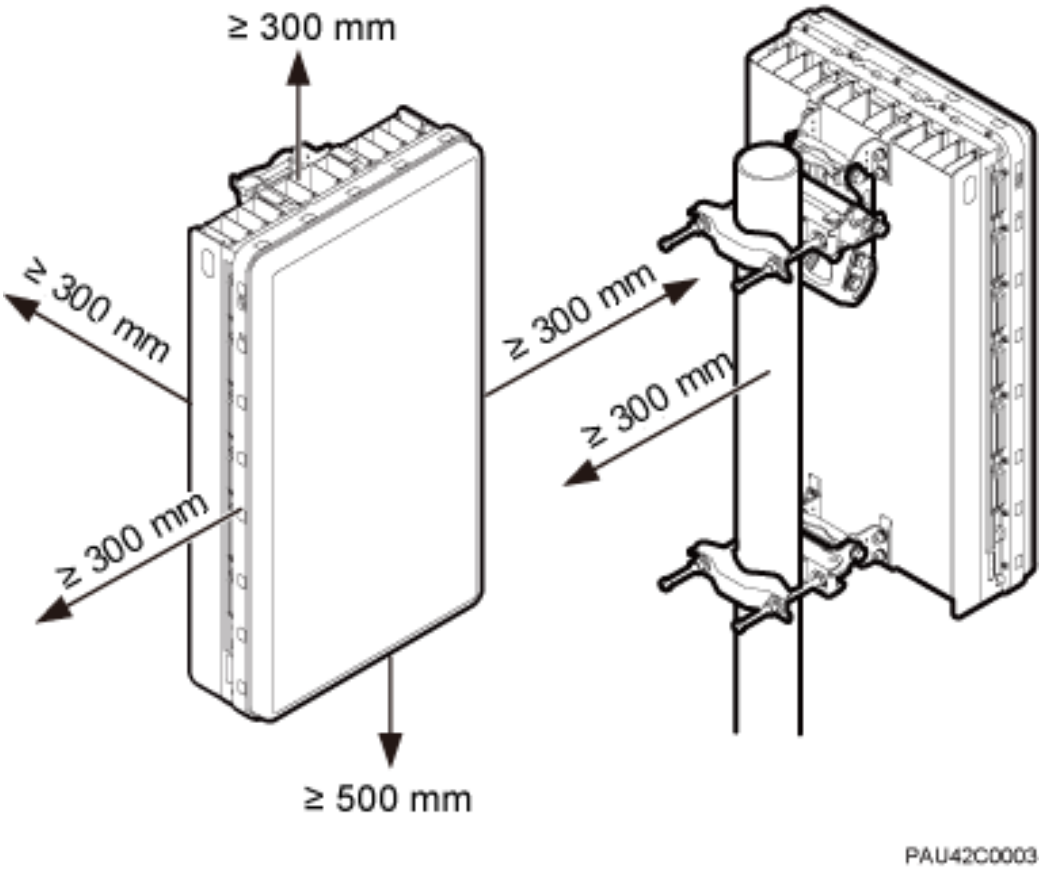
Figure 8-5 shows the clearance requirements and Figure 8-6 shows the reference installation dimensions when no blocking exists between the AAU and a passive antenna.

NOTE

- Installation distances in the following figures meet the minimum clearance requirements. If the installation space is limited and blocking exists between antennas, contact local Huawei engineers.
- For details about requirements for the isolation between antennas, contact local Huawei engineers for professional measurement and calculation.

**Figure 8-5** AAU installation clearance requirements

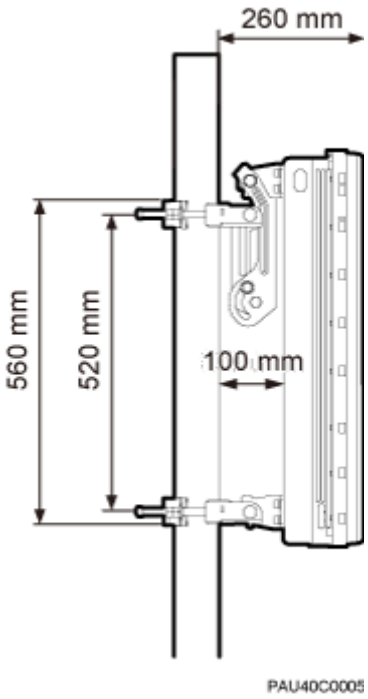



NOTE

After the downtilt supporting arm is installed, the dimensions when there is no mechanical downtilt adjustment are the same as those in Figure 8-6.

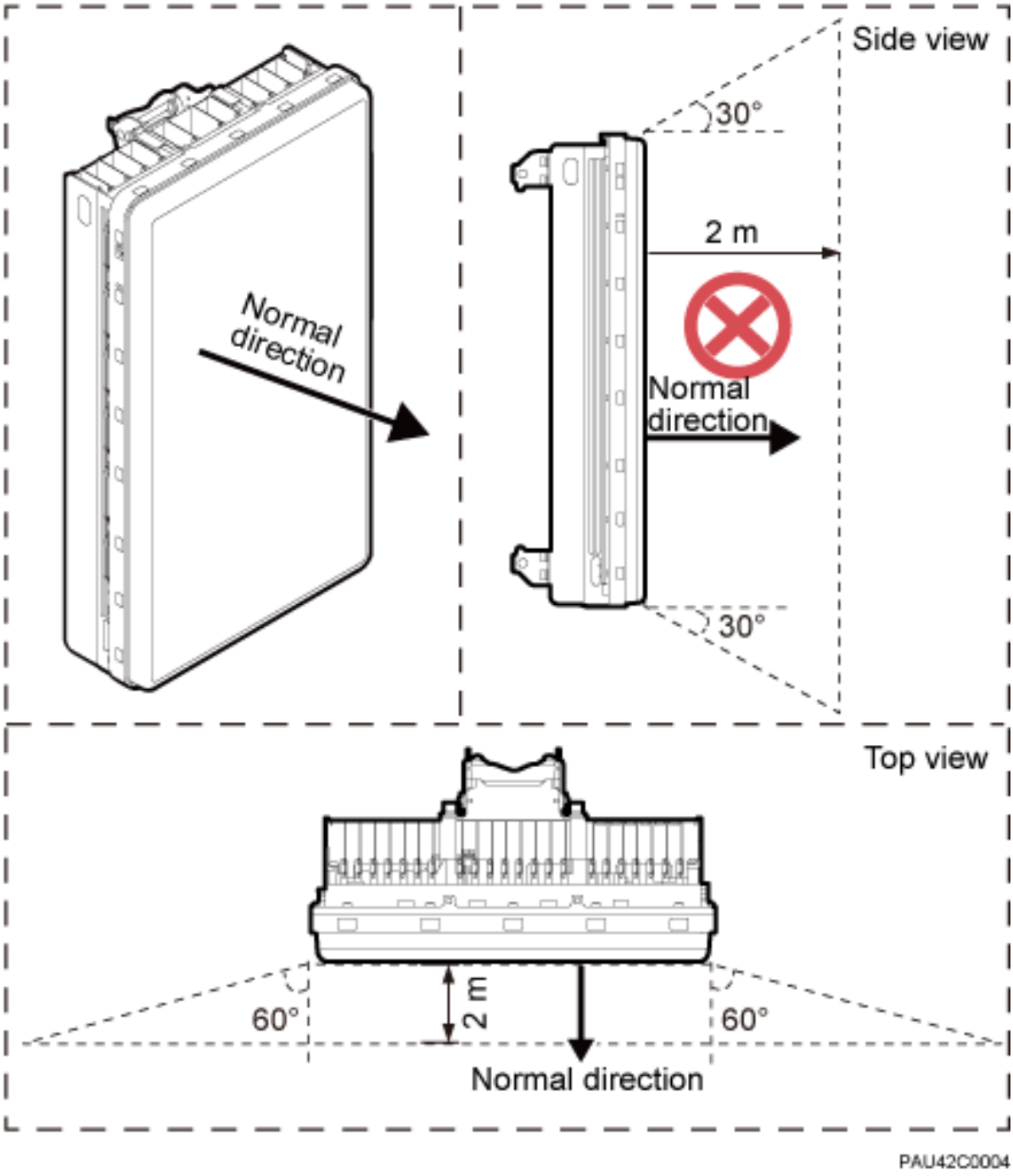
**Figure 8-6** AAU installation dimensions for reference




**NOTICE**

Keep the area within 2 m (6.56 ft) away from the AAU front panel clear of any metal barriers to ensure the AAU coverage, as shown by areas marked by dotted lines in the side view and top view in Figure 8-7.

**Figure 8-7** Affected AAU coverage scope



# 9 Acronyms and Abbreviations

**Table 9-1** Acronyms and abbreviations

| Acronym or Abbreviation | Full Name |
|---|---|
| AAS | active antenna system |
| AAU | active antenna unit |
| BBU | baseband unit |
| CPRI | common public radio interface |
| EIRP | equivalent isotropically radiated power |
| EIRS | equivalent isotropic receiver sensitivity |
| LTE | Long Term Evolution |
| MBB | mobile broadband |
| NR | New Radio |
| RRU | radio remote unit |
| 3GPP | 3rd Generation Partnership Project |