

47 27013955 Outdoor 5 GHz Dual-Polarized Directional Antenna (H25 V25 G16)

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47.1 27013955 Technical Specifications

Appearance and Structure

Figure 47-1 Appearance of the 27013955 Outdoor 5 GHz Dual-Polarized Directional Antenna (H25 V25 G16)



Technical Specifications

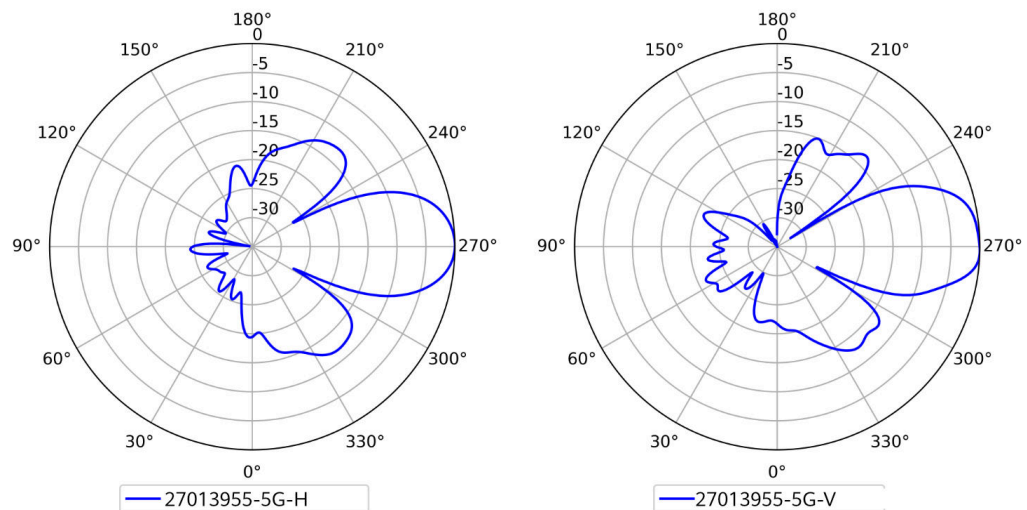
Table 47-1 Technical specifications of the 27013955 Outdoor 5 GHz Dual-Polarized Directional Antenna (H25 V25 G16)

Item	Details
Part Number	27013955
Model	ANT5G16D4NW
Description	Directional Antenna-5150~5850MHz-16dBi-25deg /25deg-Nfemale-4ports -with bracket-wall mounting
Frequency [MHz]	5150 MHz to 5850 MHz
Antenna gain [dBi]	16 dBi
Coverage distance [m(ft.)]	The coverage distance is 260 m when the transmit power and field strength of STAs are 15 dBm and -75 dBm, respectively, regardless of the local EIRP limit.
Horizontal beamwidth [degrees]	25 degrees
Vertical beamwidth [degrees]	25 degrees
Standing wave ratio (SWR)	≤ 2
Polarization	$\pm 45^\circ$
Antenna connector	N-female x 4
Antenna dimensions [mm(in.)]	64 mm x 265 mm x 134 mm (2.52 in. x 10.43 in. x 5.28 in.)
Weight without packaging [kg(lb)]	Weight of antenna: 1.26 ± 0.05 Weight of mounting bracket: 0.61 ± 0.05
Installation type	Wall
Grounding requirements	Same as the AP

Item	Details
Antenna note	The gains and lobe widths in this document are typical values. The actual values are within a range. For specifications, see the corresponding data sheets. The coverage distance is a reference value in certain conditions. Plan an appropriate distance value according to planning experience, local standards, and onsite environments. There may be differences in the standards of different countries, so the mapping between antennas and APs shall comply with local standards. For details, refer to device access authentication information. The coverage distance is subject to the following constraints: - The default AP transmit power is 15 dBm. - The default STA type is mobile phone, and no obstacle exists. - The uplink and downlink RSSIs are greater than or equal to -75 dBm. For any questions about the parameters above, contact Huawei technical support.

Antenna's Radiation Pattern

Figure 47-2 Antenna Pattern1 of the 27013955 Outdoor 5 GHz Dual-Polarized Directional Antenna (H25 V25 G16)



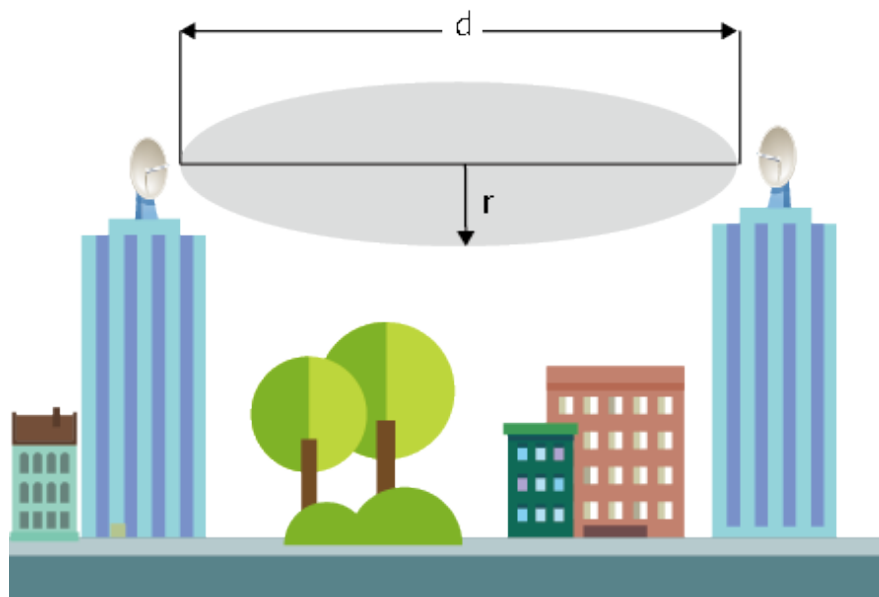
47.2 27013955 Installation Precautions

To ensure that the antenna works at the optimal performance level, take the following installation precautions:

- Install the antenna upright and place one side of the RF cable connector towards the ground.
- When installing single-polarized antennas, keep the distance between two antennas within 30 cm to 50 cm.
- Install the antenna away from metal obstructions, such as air conditioners or heating pipes. Do not install the antenna on a wire mesh.
- Wall materials and thickness determine the number of walls that radio signals can pass through. Factor that into antenna selection.
- Install lightning rods for outdoor antennas to prevent lightning strikes. For details on how to install a lightning rod, see the subsequent antenna installation section.
- Ensure that no obstacle exists in the Fresnel zone in bridging scenarios. That is, the antenna height must be larger than the sum of the radius of the first Fresnel zone and obstacle height.

As shown in the figure, the Fresnel zone refers to the ellipsoid. Obstacles in the zone will adversely affect signal transmissions. If not blocked, radio signals can travel in an approximate free space.

Figure 47-3 Fresnel zone



Fresnel zones differ depending on the Fresnel zone radius. In a free space, radio signals are mainly transmitted between antennas in the first Fresnel zone. In normal cases, the Fresnel zone refers to the first Fresnel zone.

The radius of the first Fresnel zone is calculated and related parameters are described as follows:

$$r = 17.32 \sqrt{d/4f}$$

- r : indicates the radius of the first Fresnel zone, in meters.
- d : indicates the distance between two antennas, in km.
- f : indicates the signal frequency, in GHz.

With 5 GHz signals as an example, [Table 47-2](#) lists the radius of the first Fresnel zone in different backhaul distances.

Table 47-2 Radius of the first Fresnel zone

Backhaul Distance (km)	Radius of the First Fresnel Zone (m)
1	3.87
2	5.48
3	6.71
5	8.66
10	12.25

47.3 27013955 Antenna Installation

The 27013955 antenna is an outdoor directional antenna. To obtain a better performance and wider coverage, install the antenna at high positions away from metal obstacles, such as building tops, mountaintops, and tower tops. Keep the antenna's transmit end away from obstacles.

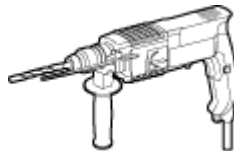
47.3.1 Accessories and Tools

Tools:

- 10 mm and 13 mm combination wrenches



- Hammer drill



- Inclinometer

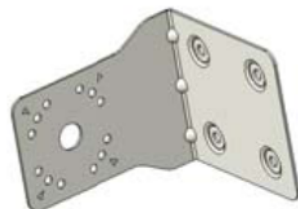


- Rubber mallet



Other accessories:

- Spring washer x 4
- Flat washer x 4
- M8x80 expansion bolt x 4
- M6 nut x 4
- Mounting bracket x 1



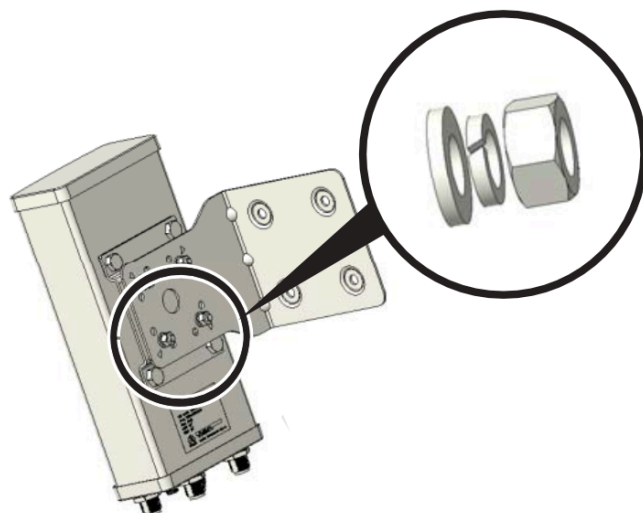
47.3.2 Wall Mounting

The 27013955 antenna can be mounted on a wall.

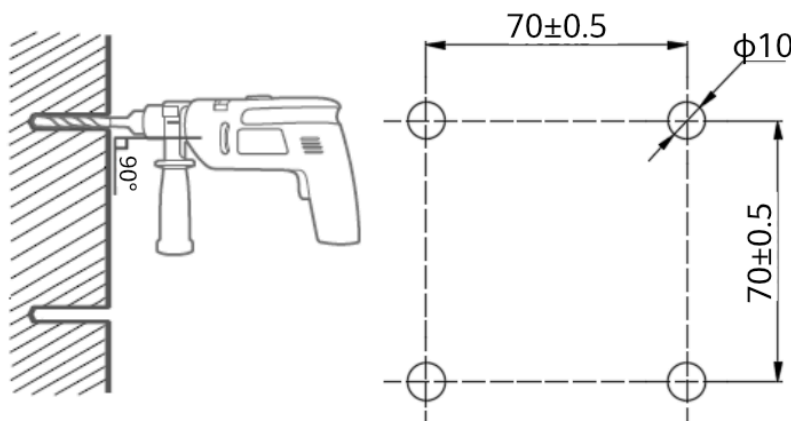
 CAUTION

- The antenna must be installed in a place far away from high-voltage power supplies or radio signal interference sources (such as other APs or antennas).
- Do not install antennas in bad weather conditions, for example, during rain, snow, or strong winds.

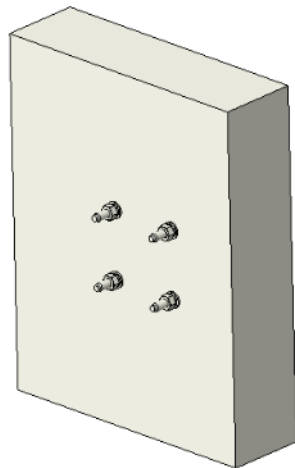
1. Use flat washers, spring washers, and nuts to secure the mounting bracket to the antenna with a reference torque of 8 N·m (70.81 lbf·in.).



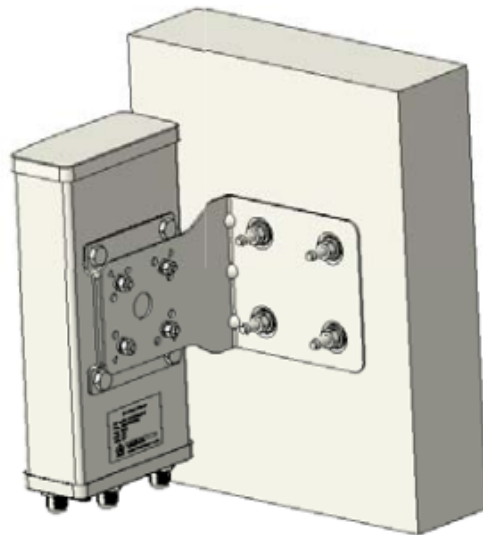
2. Drill four holes (diameter: 10 mm; depth: 60 mm) on the wall according to the hole spacing, as shown in the following figure.



3. Screw the nuts into the expansion bolts. Hammer the expansion bolts into the holes until the flat washers are closely attached to the wall. Remove the nuts, spring washers, and flat washers in sequence.



4. Align the holes on the mounting bracket with the expansion bolts on the wall, put the flat washers, spring washers, and nuts on the mounting bracket in sequence to ensure that the mounting bracket is closely attached to the wall, and then use a wrench to tighten the nuts with a reference torque of 20 N·m (177.01 lbf·in.).



47.3.3 Connecting RF Cables

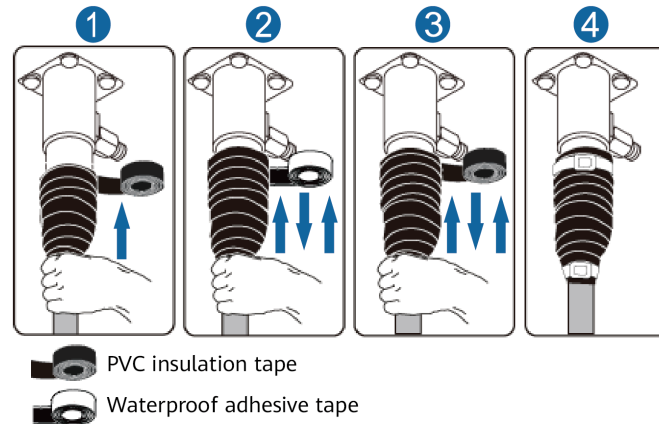
RF Cable Connection Requirements

The feeders of the same antenna must be connected to the 5 GHz RF ports on the same AP. The connection rules for antennas are the same as those for RF cables on the AP.

RF Cable Deployment Requirements

- Use a short feeder cable to connect the antenna to an AP.
- It is recommended that you connect a 50 ohm RF load to an idle antenna interface and wrap the RF load with both the insulation and waterproof tape.
- Wrap the RF cable in single-layer PVC insulation tape, triple-layer waterproof tape, and then triple-layer PVC insulation tape.

- Before wrapping the waterproof tape, stretch the tape evenly until it is 1/2 the width as before. With each layer of tape wrap the cable tightly and ensure that each layer covers more than 50% of the layer beneath it.
- Wrap the triple-layer tape from bottom to top, from top to bottom, and then from bottom to top again.



- Bend radius requirements: RG-8U RF cable: > 150 mm; 1/2" RF cable: > 50 mm; 7/8" RF cable: > 250 mm. One inch (1") equals 25.4 mm.

RF Cable Connections

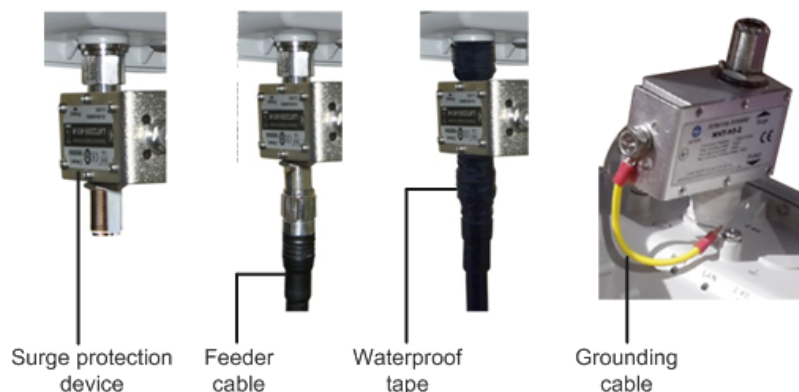
1. Antenna interfaces of Huawei outdoor APs provide a 5 kA surge protection capability. In general, no additional surge protective device needs to be installed, and the RF cables are directly connected to the antenna interfaces with a tightening torque of 0.8 N·m.



NOTE

Outdoor APs support built-in surge protection on all interfaces, but the surge protection works only when the outdoor APs are grounded.

2. If a higher surge protection capability is required, you need to purchase a surge protective device separately. When installing the surge protective device, ensure that it is connected to a ground cable.



Instructions on Making RF Cables

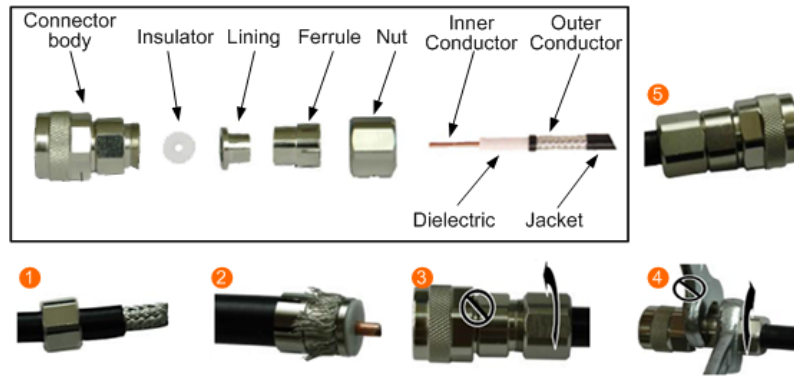
When making RF cables onsite, ensure that the coaxial cables and connectors in use comply with the mappings described in Table [Coaxial cables and connectors](#).

Table 47-3 Coaxial cables and connectors

Coaxial Cable	Coaxial Connector	Cable Loss	Appearance
RG-8U(2507009)	Type-N male connector (14040184)	2400MHz ~2483.5 MHz: 26.8dB/100m 4920Mhz ~5825Mhz: 41.8dB/100m	
1/2" (inch) super-flexible cable (25070076)	Type-N male connector (14040150)	2400MHz ~2483.5 MHz: 18.1dB/100m 4920Mhz ~5825Mhz: 30dB/100m	

Connecting the type-N male coaxial connector to the RG-8U feeder cable

1. Peel the cable.
2. Install accessories, such as the nut.
3. Install the connector body.
4. Tighten the connector on the cable.
5. After assembly is complete, verify that cable attenuation is within the proper range. Take waterproof measures during the operation.



Connecting the type-N male coaxial connector to the 1/2" feeder cable

1. Peel the cable.
2. Install the back nut.
3. Install the front nut.
4. Put the cable through the heat-shrink tubing.
5. After assembly is complete, verify that cable attenuation is within the proper range. Take waterproof measures during the operation.

