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27012048 Rail Transportation 2.4 GHz Dual-Polarized Directional Antenna (H35 V35 G12)

About This Chapter

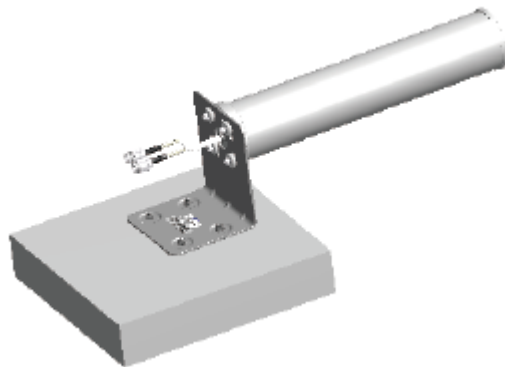
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31.1 27012048 Technical Specifications

Appearance and Structure

Figure 31-1 Appearance of the 27012048 Rail Transportation 2.4 GHz Dual-Polarized Directional Antenna (H35 V35 G12)



Technical Specifications

Table 31-1 Technical specifications of the 27012048 Rail Transportation 2.4 GHz Dual-Polarized Directional Antenna (H35 V35 G12)

Item	Details
Part Number	27012048
Model	ANT2G12D2NW
Description	Directional Antenna,2400~2500MHz, 12dBi,35deg/35deg,N/Female, 2port,with mounting parts,wall mounting
Frequency [MHz]	2400 MHz to 2500 MHz
Antenna gain [dBi]	12 dBi
Coverage distance [m(ft.)]	150 m(ft.)
Horizontal beamwidth [degrees]	35 degrees
Vertical beamwidth [degrees]	35 degrees
Standing wave ratio (SWR)	≤ 2
Polarization	Horizontal and vertical polarization
Antenna connector	N-female x 2
Antenna dimensions [mm(in.)]	Diameter x Length: $\phi 84 \times 385$
Weight without packaging [kg(lb)]	1220 kg(lb)
Installation type	Wall
Grounding requirements	Same as the AP
Pole diameter [mm(in.)]	$\phi 25$ to $\phi 50$

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. 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. - 2.4 GHz: The uplink and downlink RSSIs are greater than or equal to -70 dBm. For any questions about the parameters above, contact Huawei technical support.

Antenna's Radiation Pattern

Figure 31-2 Antenna Pattern1 of the 27012048 Rail Transportation 2.4 GHz Dual-Polarized Directional Antenna (H35 V35 G12)

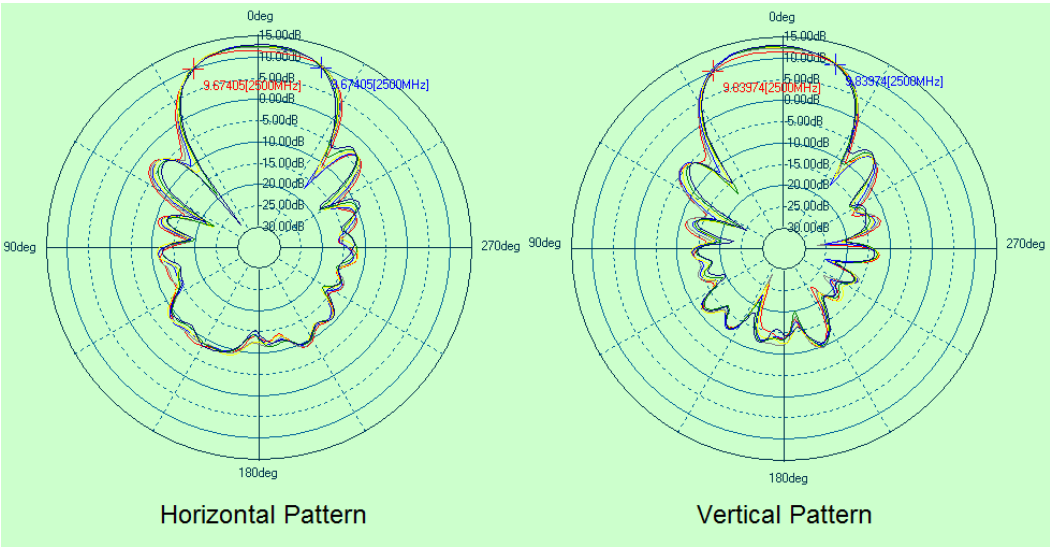
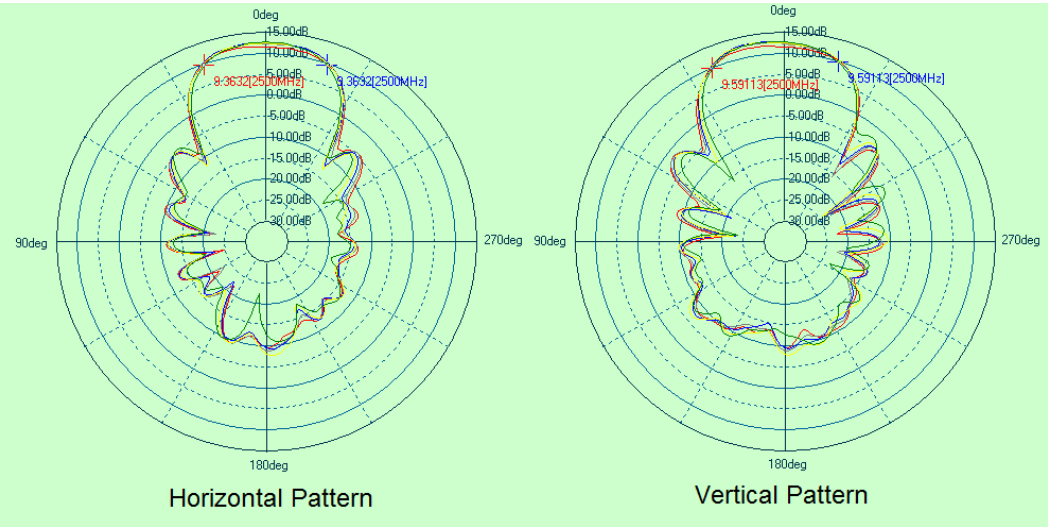


Figure 31-3 Antenna Pattern2 of the 27012048 Rail Transportation 2.4 GHz Dual-Polarized Directional Antenna (H35 V35 G12)



31.2 27012048 Antenna Installation

The 27012048 antenna is a directional antenna. It can be installed on an inner wall of a tunnel and in vehicle-ground backhaul scenarios.

31.2.1 Accessories and Tools

The following accessories and tools are required for installing the 27012048 antenna.

Accessory/Tool	Quant ity	Picture
Torque socket (M6)	1 PCS	
Level	1 PCS	
Rubber mallet	1 PCS	
Hammer drill (the drill bit diameter is 8 mm)	1 PCS	

Accessory/Tool	Quantity	Picture
Sheet metal mounting bracket	1 PCS	
Expansion bolts (M6 x 60)	4 sets	

31.2.2 Wall Mounting

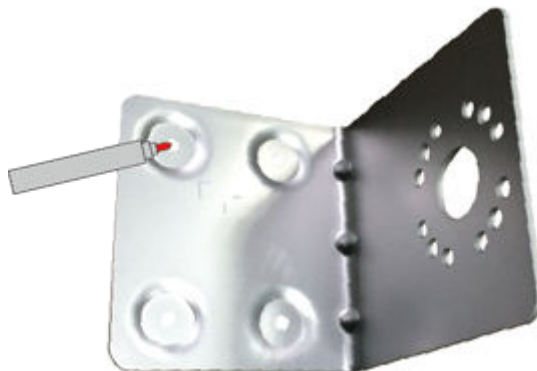
Precautions

Pay attention to the following points when installing this antenna:

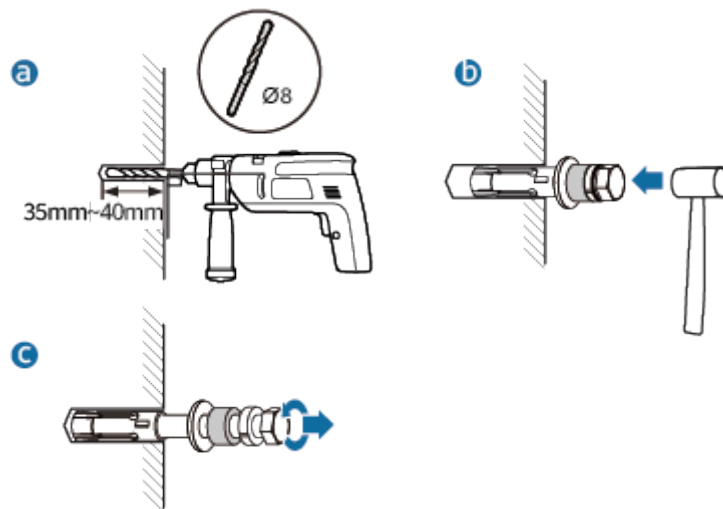
- The distance between the installation height and the height of antennas of vehicle-mounted APs is less than 30 cm. It is recommended that it be installed at a position 20 cm higher than the antennas of vehicle-mounted APs.
- The tubular central axis of the antenna is horizontally paralleled with the rails and the angle between the antenna and wall is less than 1°. Do not incline the antenna towards the wall.
- If you customize mounting brackets, ensure that the distance between the central axis of the antenna and the installation wall is no less than 15 cm.

Wall Mounting

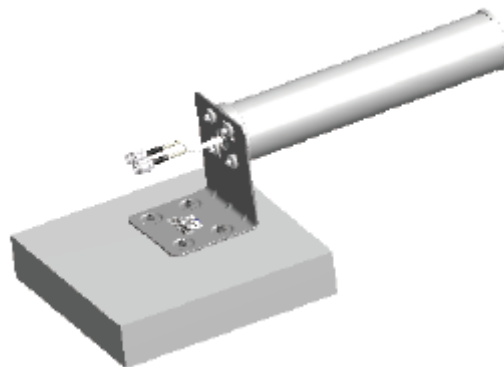
1. Fix the mounting bracket to the wall, adjust the installation position using a level, and mark positions of four mounting holes.



2. Use a hammer drill to drill holes at the four marked positions. Screw the nut into the expansion bolt, hammer the expansion bolt into a hole until the flat washer is closely attached to the wall. Remove the nut, spring washer, and flat washer in order.



3. Fix the antenna onto the mounting bracket, fit flat washers, spring washers, and nuts in order, and tighten the nuts (the tightening torque is 5 N m). Stretch the feeder port out of the hole of the mounting bracket.
4. Pinch the mounting bracket on the expansion bolts, fit flat washers, spring washers, and nuts in order, and tighten the nuts (the tightening torque is 5 N m).



31.2.3 Connecting RF Cables

RF Cable Connection

Connect the feeder connector to the radio interface of an AP using an RF transit cable (sold separately) and tighten the connector to the interface. A 1 N m tightening torque is recommended for the type-N connector.

The following table lists the RF transit cables and connectors used.

AP Type	Coaxial Cable	Coaxial Connector	Cable Loss	Appearance
AP8130DN	RG-8U cable (25070009)	Type-N male connector (14040184)	2400 MHz to 2483.5 MHz: 26.8 dB / 100 m 4920 Mhz to 5825 Mhz: 41.8 dB / 100 m	
	1/2" (inch) super-flexible cable (25070076)	Type-N male connector (14040150)	2400 MHz to 2483.5 MHz: 18.1 dB / 100 m 4920 Mhz to 5825 Mhz: 30 dB / 100 m	

AP Type	Coaxial Cable	Coaxial Connector	Cable Loss	Appearance
AP9131 DN/AP9132 DN	RF transit cable (0.4130714, 0.5m) connecting a QMA-J connector to an N-J connector.	- (No cable needs to be made onsite.)	2.4 GHz to 2.5 GHz: < 0.9 dB 4.9 GHz to 6 GHz: < 1.3 dB	

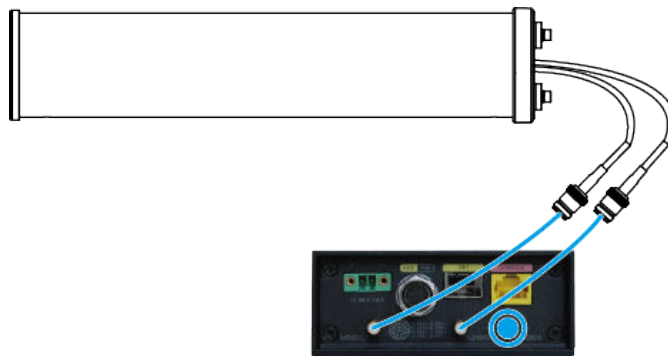
AP Type	Coaxial Cable	Coaxial Connector	Cable Loss	Appearance
	RF transit cable (04 130 714 -00 1, 3 m) connecting a QM A-J connector to an N-J connector.		• 2.4 GHz to 2.5 GHz: < 2.3 dB • 4.9 GHz to 6 GHz: < 3.2 dB	

The requirements on connections between the antenna and the AP's radio interfaces are as follows:

AP Model	Principle for RF Cable Connection
AP8130DN	• Feeders of the same antenna must be connected to radio interfaces of the corresponding frequency bands on the same AP. • Two ports on the antenna are connected to radio interfaces A and B of the AP, and an RF load should be connected to radio interface C of the AP.
AP9131DN	Two ports on the antenna are connected to radio interfaces 2.4G/5G-B and 2.4G/5G-C of the AP, and an RF load should be connected to radio interface 2.4G/5G-A of the AP.

AP Model	Principle for RF Cable Connection
AP9132DN	- When the antenna transmits 2.4 GHz and 5 GHz signals simultaneously on a radio interface, two ports on the antenna are connected to radio interfaces 2.4G/5G-B and 2.4G/5G-C of the AP respectively, and an RF load should be connected to radio interface 2.4G/5G-A of the AP. - When the antenna transmits only 2.4 GHz or 5 GHz signals on a radio interface, two ports on the antenna are connected to radio interfaces 2.4G-A and 2.4G-B of the AP, and an RF load should be connected to radio interface 2.4G-C of the AP to transmit 2.4 GHz signals.

Take the AP9131DN as an example. The following figure shows the RF cable connection on the AP9131DN.



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 the tape length is twice its original length. 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.
- The grounding requirements of antennas are the same as those of APs.

RF Cable Connections

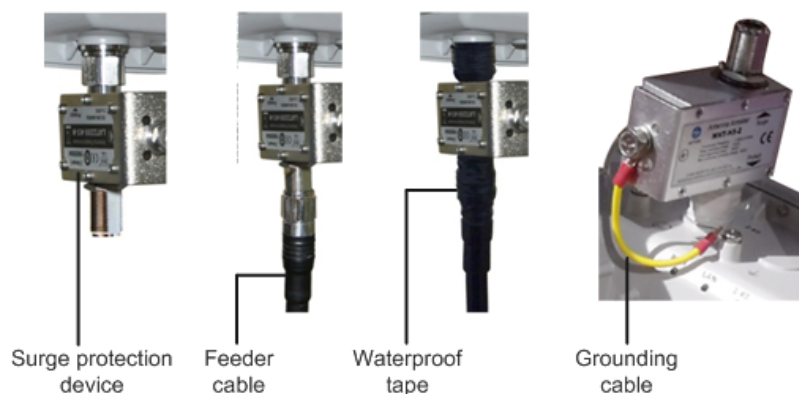
1. Antenna interfaces of Huawei outdoor APs provide a 5 kA surge protection capability. In general, no additional surge protective device needs to be installed, and the RF cables are directly connected to the antenna interfaces.



 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.

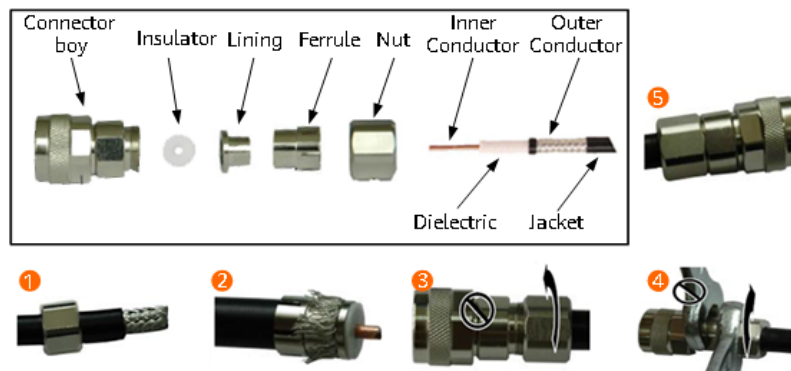


Instructions on Making RF Cables

When connecting the AP8130DN, you need to assemble the type-N male connector and 1/2" (inch) super-flexible feeder cable onsite in the following way:

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.

