



Huawei

WLAN Indoor/Rail Transportation APs

Antenna

Datasheet



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1 Antenna Description..... //

WLAN antennas are described as follows:

- [Radio frequency band](#)

WLAN works on ISM bands: 2.4 GHz and 5 GHz. Antennas can be classified into 2.4 GHz, 5 GHz, and 2.4 GHz & 5 GHz antennas by frequency band support.

- [Polarization](#)

WLAN antennas are classified into single-polarized and dual-polarized antennas by polarization. A single-polarized antenna provides one radio port, and a dual-polarized antenna provides two.

- [Antenna gain](#)

Antenna gain is a key parameter for measuring the coverage capability of an antenna. For the same type of antennas, a higher-gain antenna supports a higher coverage distance and better effect.

- [Radiation](#)

WLAN antennas support omnidirectional and directional radiation patterns. Omnidirectional antennas are applicable to indoor coverage scenarios, and directional antennas to outdoor coverage scenarios. Directional antennas can also be deployed indoors, such as large convention centers, conference centers, airports, and stations.

- [Beamwidth](#)

An antenna has horizontal beamwidth and vertical beamwidth, forming a horizontal lobe angle and a vertical lobe angle, respectively. In most cases, the beamwidth is the angular separation between the points in the main lobe where the radiated power has fallen by 3 dB (half-power) below that on the center line of the lobe. The beamwidth is also called the half-power beamwidth.

- [Coverage distance](#)

The coverage distance of an antenna is the valid coverage distance of wireless services. An omnidirectional antenna supports a coverage distance of 100–200 m, and a directional antenna supports over 200 m.

- [Installation mode](#)

Antennas can be directly connected to APs or mounted on a wall, ceiling, or pole. The pole mounting mode is the mainstream mode.

2 Selection Policy..... //

Before determining an AP model and antenna, consider the basic principles and port types of APs and antennas.

Table 2-1 Basic principles

No.	Factors of Consideration	Description
1	Usage scenario and purpose	<ul style="list-style-type: none"> Indoor scenarios: Use indoor APs and antennas to provide signal coverage. Outdoor scenarios: Use outdoor APs and antennas with a high Ingress Protection (IP) grade and certain surge protection capability to provide signal coverage and bridge backhaul. Rail transportation scenarios: <ul style="list-style-type: none"> Train-ground communications: Use outdoor APs and antennas with a high IP grade and certain anti-vibration capability. Compartment coverage: Use indoor APs and antennas with certain anti-vibration capability to provide signal coverage. Station platform coverage: Use the same APs as the common outdoor and indoor scenarios.
2	Local standards and regulations	The transmit power and maximum gain of antennas must strictly comply with local standards and regulations. For the rail transportation scenarios, the performance, environment adaptability, and anti-vibration capability of the antennas must also confirm to requirements of the related railway authorities.
3	Coverage or backhaul area and distance	<ul style="list-style-type: none"> Coverage: Directional antennas are recommended for long and narrow areas while omnidirectional antennas are recommended for round and square areas. Backhaul: Directional antennas are usually used. If the backhaul distance is long, high-gain antennas should be used; if the backhaul target is concentrated, small-angle antennas should be used.
4	Transmission frequency for radio signals	<ul style="list-style-type: none"> Coverage: To implement 2.4 and 5G signal coverage, use 2.4G and 5G antennas separately in the same area or use dual-band antennas. Backhaul: The 2.4G antennas are not used for backhaul.
5	Construction cost and simplicity	An external directional antenna usually has a large size and needs to be connected to the AP's radio interface through a feeder cable. Compared to a built-in antenna and whip antenna directly installed on an AP, installing an external directional antenna requires higher construction cost and may affect indoor simplicity. To further simplify cable layout (especially in coverage scenarios) without compromising signal quality, you are advised to use built-in or whip antennas directly installed on APs.

Table 2-2 Port types of APs and antennas

No.	Product Type	Product Model	Port Type	Remarks
1	Indoor distributed AP	AP6310SN	1 x Type-N Female	
2		AP9330DN	12 x RP-SMA	

No.	Product Type	Product Model	Port Type	Remarks
3	Rail transportation AP	AP9131DN	3 x QMA-female	
4		AP9132DN	6 x QMA-female	
5	Outdoor AP	AP8130DN	6 x Type-N Female	
6		AP8150DN	4 x Type-N Female	
7	Indoor AP antenna	27010209	1 x Type-N Female	2.4 GHz single-polarized directional antenna
8		27010210	1 x Type-N Female	2.4 GHz single-polarized omnidirectional antenna
9		27011792	2 x SMA-K (SMA-female)	Dual-band dual-polarized directional antenna
10	Rail transportation AP — Vehicle-mounted antenna	27012050	3 x QMA-male	5 GHz dual-polarized directional antenna
11		27012075	1 x SMA-K (SMA-female)	Dual-band single-polarized directional antenna
12		27012045	3 x QMA-male	Dual-band dual-polarized directional antenna
13	Rail transportation AP — Trackside/Vehicle-mounted antenna	27011619	2 x Type-N Female	2.4 GHz dual-polarized directional antenna
14		27012048	2 x Type-N Female	2.4 GHz dual-polarized directional antenna
15		27011618	3 x Type-N Female	5 GHz dual-polarized directional antenna
16		27012046	3 x Type-N Female	5 GHz dual-polarized directional antenna
17		27012140	3 x Type-N Female	5 GHz dual-polarized directional antenna

NOTE: When connecting an antenna to an AP, fully consider the type and number of radio ports on the antenna and AP.

3 Antennas for Indoor Distributed APs..... //

Antennas of indoor distributed APs on sales include 2.4 GHz single-polarized directional antennas, 2.4 GHz single-polarized omnidirectional antennas, and 2.4 GHz & 5 GHz dual-polarized directional antennas.

3.1 2.4 GHz Single-Polarized Directional Antenna

The 27010209 antenna is an indoor directional antenna. It forms a major lobe in a certain direction with high gains, while other directions have low gains. It applies to scenarios that require small coverage angles but long coverage distances. Typical scenarios include corridors in hospitals or airports.

- 3.1.1 Antenna Appearance

Figure 3-1 Appearance of the 27010209 antenna



- 3.1.2 Technical Specifications

Table 3-1 Technical specifications of the 27010209 antenna

Item	Value
Frequency (MHz)	1710–2500
Gain (dBi)	7
Horizontal lobe width (degrees)	88
Vertical lobe width (degrees)	47
Standing wave ratio (SWR)	≤ 1.5

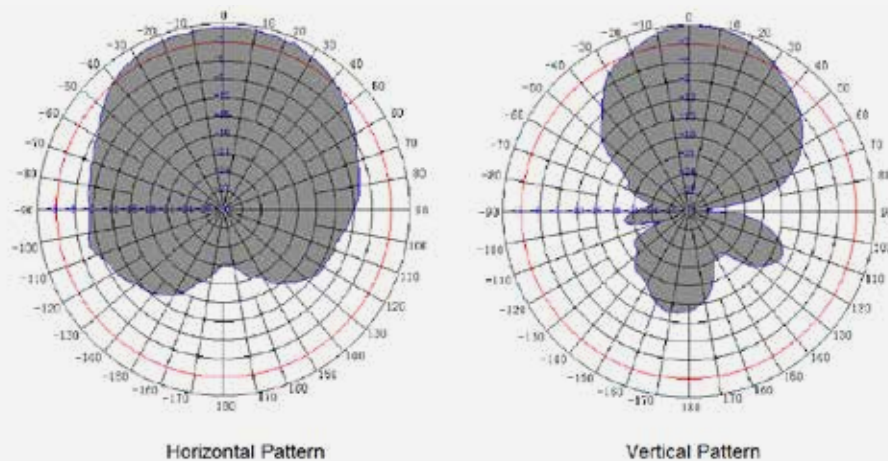
Item	Value
Polarization	Vertical polarization
Connector	N-female
Dimensions (mm)	H x W x D: 210 x 180 x 44
Weight (g)	430
Mounting mode	Wall mounting
Applicable AP	AP6310SN

NOTE: 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.

- 3.1.3 Antenna Pattern

Figure 3-2 shows radiation patterns of the 27010209 antenna in the horizontal and vertical directions.

Figure 3-2 Radiation pattern of the 27010209 antenna



3.2 2.4 GHz Single-Polarized Omnidirectional Antenna

The 27010210 antenna is an indoor omnidirectional antenna. The antenna is best applied to indoor omnidirectional coverage scenarios, such as open office areas, meeting rooms, and lecture halls.

- 3.2.1 Antenna Appearance

Figure 3-3 Appearance of the 27010210 antenna



- 3.2.2 Technical Specifications

Table 3-2 Technical specifications of the 27010210 antenna

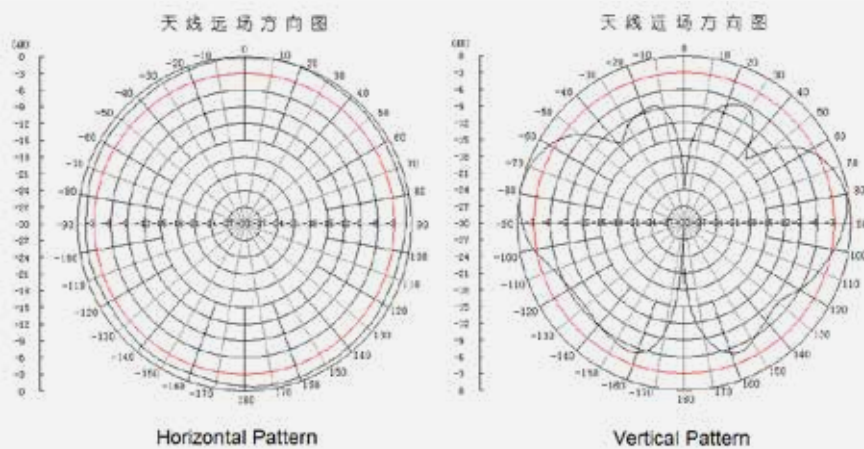
Item	Value
Frequency (MHz)	1710–2500
Gain (dBi)	3
Horizontal lobe width (degrees)	360
Vertical lobe width (degrees)	45
Standing wave ratio (SWR)	≤ 1.5
Polarization	Vertical polarization
Connector	N-female
Dimensions (mm)	Φ 186 x 85
Weight (g)	275
Mounting mode	Ceiling mounting
Applicable AP	AP6310SN

NOTE: 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.

- 3.2.3 Antenna Pattern

Figure 3-4 shows radiation patterns of the 27010210 antenna in the horizontal and vertical directions.

Figure 3-4 Radiation pattern of the 27010210 antenna



3.3 2.4 GHz & 5 GHz Dual-Polarized Directional Antenna

The 27011792 antenna is an indoor directional antenna. It applies to scenarios that require small coverage angles but long coverage distances. Typical scenarios include corridors in hospitals or airports.

- 3.3.1 Antenna Appearance

Figure 3-5 and Figure 3-6 shows the appearance of the 27011792 antenna.

Figure 3-5 Appearance of the 27011792 antenna (1)

Figure 3-6 Appearance of the 27011792 antenna (2)



- 3.3.2 Technical Specifications

Table 3-3 Technical specifications of the 27011792 antenna

Item	Value	
	2.4G	5G
Frequency (MHz)	2400–2500	5150–5850
Gain (dBi)	4	6
Horizontal lobe width (degrees)	75	75
Vertical lobe width (degrees)	55	50
Standing wave ratio (SWR)	≤ 2	≤ 2
Polarization	Horizontal polarization and vertical polarization	
Connector	2 x SMA-K	
Dimensions (mm)	H x W x D: 86 x 86 x 25	
Weight (g)	70 ± 10	
Mounting mode	Wall mounting	
Applicable AP	AP9330DN	

NOTE: 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.

- 3.3.3 Antenna Pattern

Figure 3-7 and Figure 3-8 show radiation patterns of the two ports on the 27011792 antenna in the horizontal and vertical directions.

Figure 3-7 Radiation pattern of port 1 on the 27011792 antenna

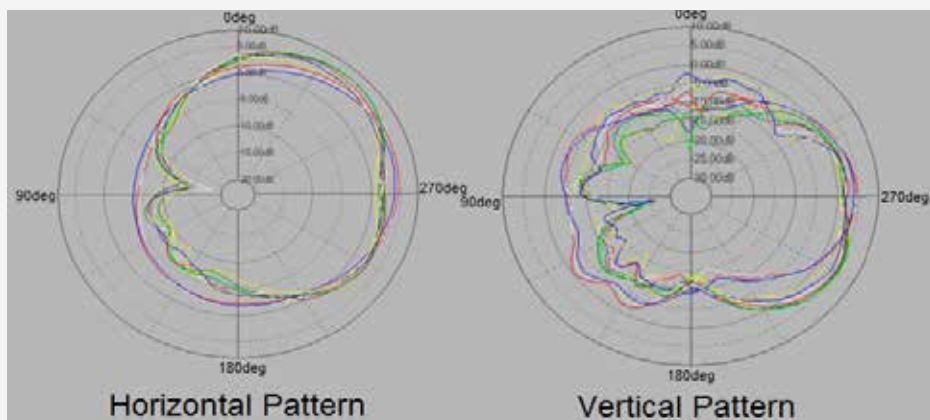
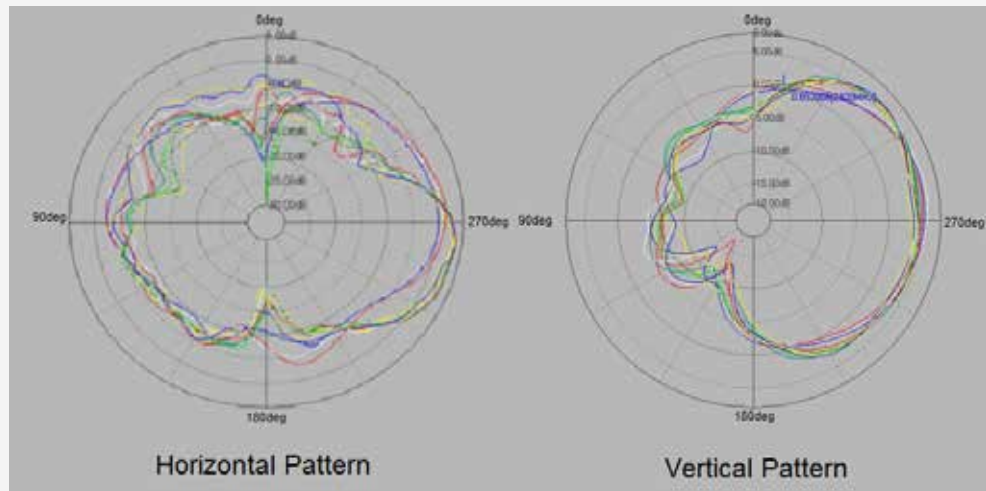


Figure 3-8 Radiation pattern of port 2 on the 27011792 antenna



4 Antennas for Compartment Coverage APs

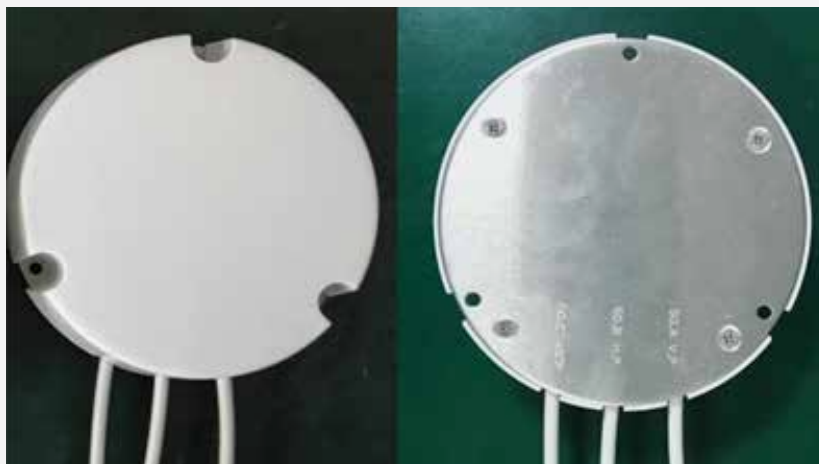
Antennas for compartment coverage APs on sales include 5 GHz dual-polarized directional antennas, 2.4 GHz & 5 GHz single-polarized directional antennas, and 2.4 GHz & 5 GHz dual-polarized directional antennas.

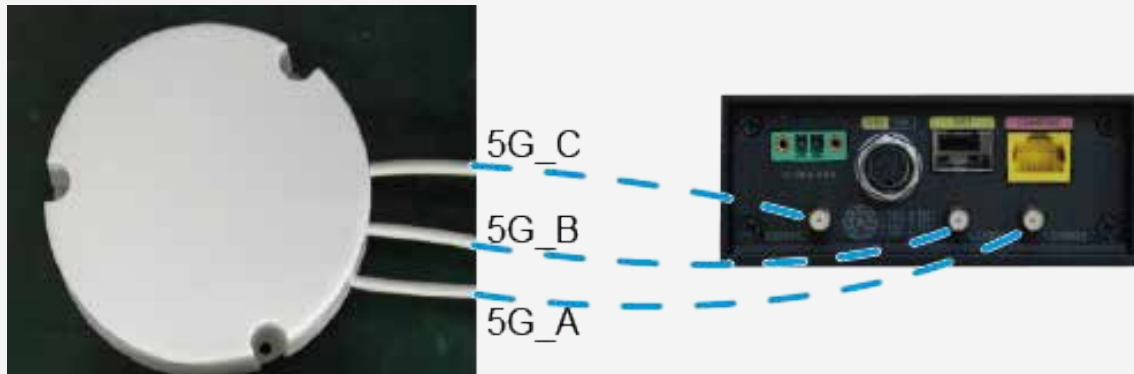
4.1 5 GHz Dual-Polarized Directional Antenna

The 27012050 antenna is a vehicle-mounted directional antenna and applicable to wireless coverage on vehicles.

- 4.1.1 Antenna Appearance

Figure 4-1 Appearance of the 27012050 antenna





- 4.1.2 Technical Specifications

Table 4-1 Technical specifications of the 27012050 antenna

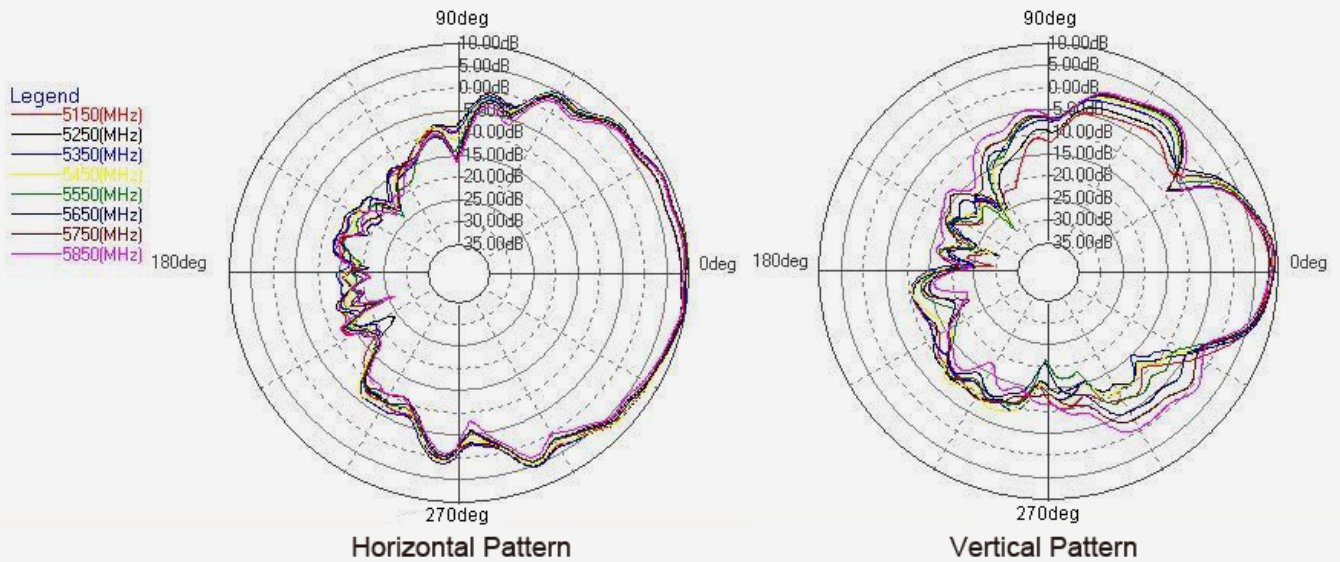
Item	Value
Frequency (MHz)	5150-5850
Gain (dBi)	9
Horizontal lobe width (degrees)	70
Vertical lobe width (degree)	35
Standing wave ratio (SWR)	≤ 2
Polarization	Horizontal, vertical, and cross polarization
Connector	3 x QMA-male
Dimensions (mm)	Diameter x Length: ϕ 110 x 33
Weight (g)	240
Mounting mode	Wall mounting
Applicable AP	AP9132DN

NOTE: 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.

- 4.1.3 Antenna Pattern

The following figure shows the radiation pattern of the 27012050 antenna in the horizontal and vertical directions.

Figure 4-2 Radiation pattern of the 27012050 antenna



4.2 2.4 GHz & 5 GHz Single-Polarized Directional Antenna

The 27012075 antenna is a vehicle-mounted directional antenna and applicable to wireless coverage on vehicles.

- 4.2.1 Antenna Appearance

Figure 4-3 Appearance of the 27012075 antenna



- 4.2.2 Technical Specifications

Table 4-2 Technical specifications of the 27012075 antenna

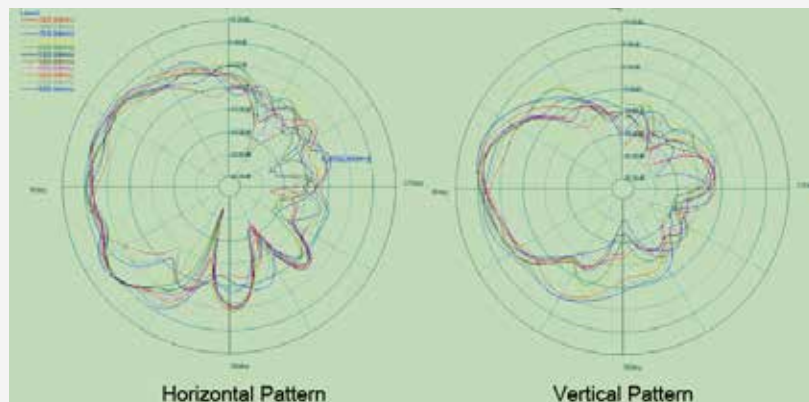
Item	Value	
	2.4G	5G
Frequency (MHz)	2400-2500	5150-5850
Gain (dBi)	4	6
Horizontal lobe width (degrees)	80	80
Vertical lobe width (degree)	40	40
Standing wave ratio (SWR)	≤ 2	≤ 2
Polarization	Vertical polarization	
Connector	SMA-K	
Dimensions (mm)	Length x Width x Height: 86 x 86 x 23	
Weight (g)	65	
Mounting mode	Wall mounting	
Applicable AP	AP9131DN/AP9132DN	

NOTE: 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.

- 4.2.3 Antenna Pattern

The following figure shows the radiation pattern of the 27012075 antenna in the horizontal and vertical directions.

Figure 4-4 Radiation pattern of the 27012075 antenna

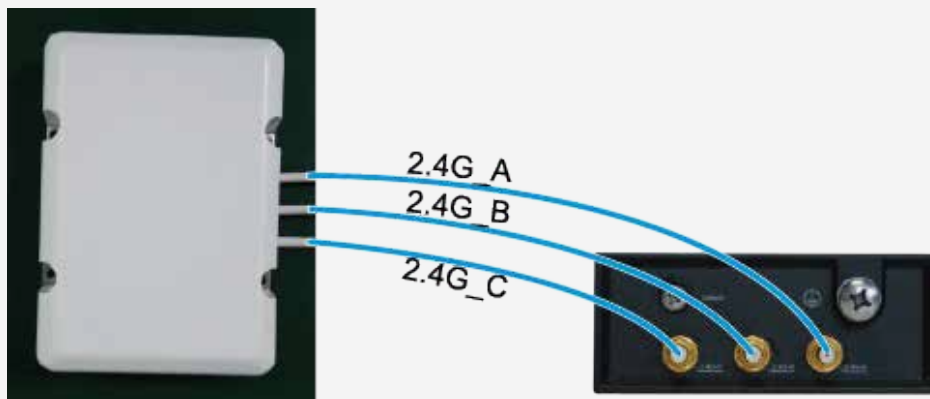
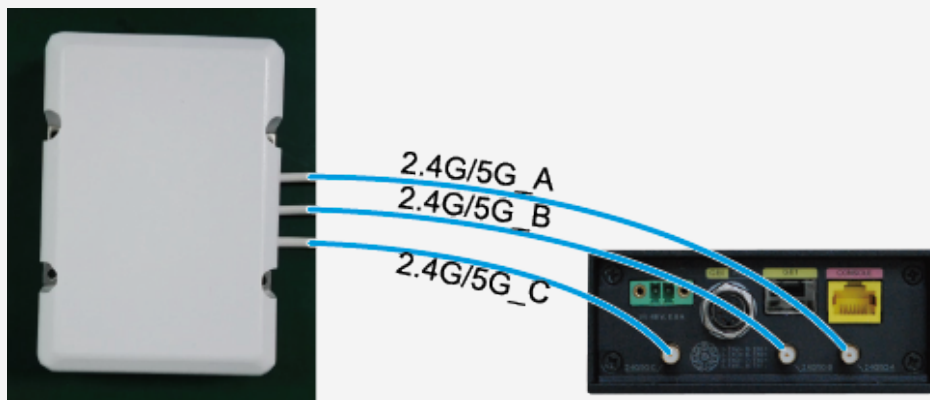


4.3 2.4 GHz & 5 GHz Dual-Polarized Directional Antenna

The 27012045 antenna is a vehicle-mounted directional antenna and applicable to wireless coverage on vehicles.

- 4.3.1 Antenna Appearance

Figure 4-5 Appearance of the 27012045 antenna



- 4.3.2 Technical Specifications

Table 4-3 Technical specifications of the 27012045 antenna

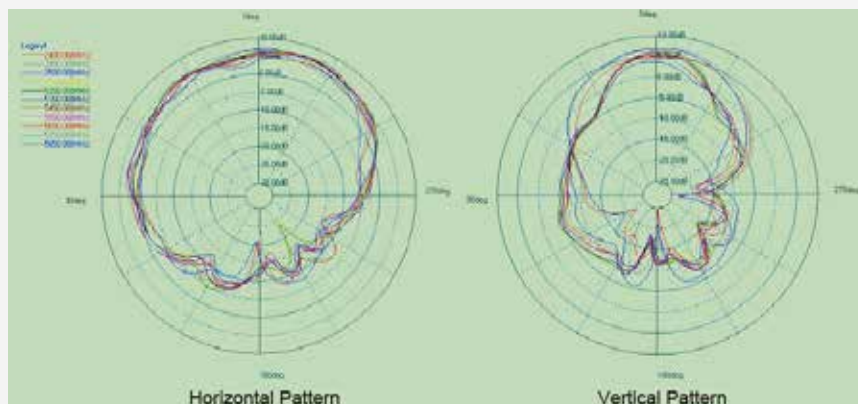
Item	Value	
	2.4G	5G
Frequency (MHz)	2400-2500	5150-5850
Gain (dBi)	5.5	6
Horizontal lobe width (degrees)	75	80
Vertical lobe width (degree)	65	40
Standing wave ratio (SWR)	≤ 2	≤ 2
Polarization	Horizontal, vertical, and cross polarization	
Connector	3 x QMA-male	
Dimensions (mm)	Length x Width x Height: 140 x 100 x 35	
Weight (g)	260	
Mounting mode	Wall mounting	
Applicable AP	AP9131DN/AP9132DN	

NOTE: 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.

- 4.3.3 Antenna Pattern

The following figure shows the radiation pattern of the 27012045 antenna in the horizontal and vertical directions.

Figure 4-6 Radiation pattern of the 27012045 antenna



5 Antennas for Trainside/Vehicle-Mounted APs.....//

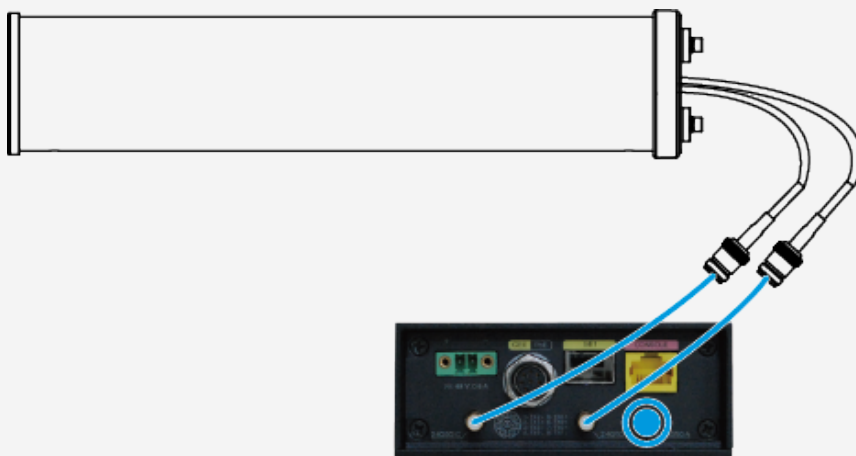
Antennas for trackside and vehicle-mounted APs on sales include 2.4 GHz dual-polarized directional antennas and 5 GHz dual-polarized directional antennas.

5.1 2.4 GHz Dual-Polarized Directional Antenna

The 27011619 antenna is a directional antenna applicable to outdoor and rail transportation scenarios.

- 5.1.1 Antenna Appearance

Figure 5-1 Appearance of the 27011619 antenna



- 5.1.2 Technical Specifications

Table 5-1 Technical specifications of the 27011619 antenna

Item	Value
Frequency (MHz)	2400–2500
Gain (dBi)	12
Horizontal lobe width (degrees)	35
Vertical lobe width (degrees)	35
Standing wave ratio (SWR)	≤ 2
Polarization	Horizontal polarization and vertical polarization
Connector	2 x N-female
Dimensions (mm)	Diameter x Length: ϕ 84 x 385
Weight (g)	1220
Support pole diameter (mm)	ϕ 25– ϕ 50
Mounting mode	Pole mounting
Applicable AP	AP8130DN/AP8150DN/AP9131DN/AP9132DN

NOTE: 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.

- 5.1.3 Antenna Pattern

Figure 5-2 and Figure 5-3 show radiation patterns of the two ports on the 27011619 antenna in the horizontal and vertical directions.

Figure 5-2 Radiation pattern of port 1 on the 27011619 antenna

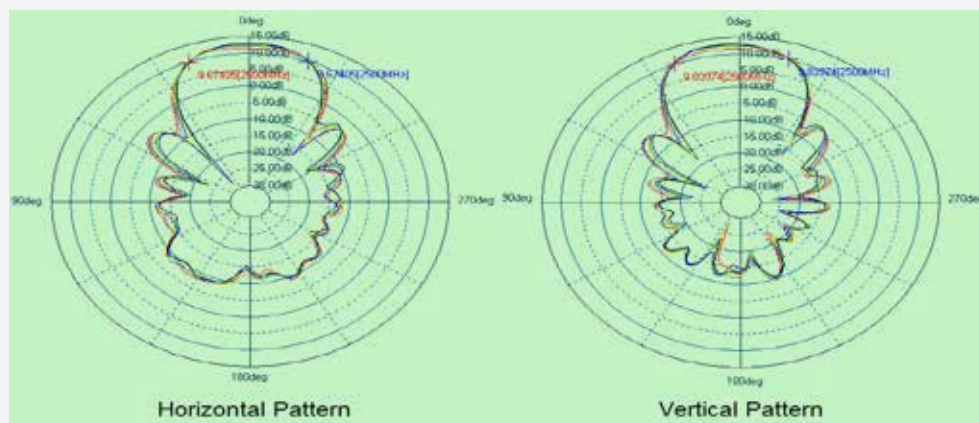
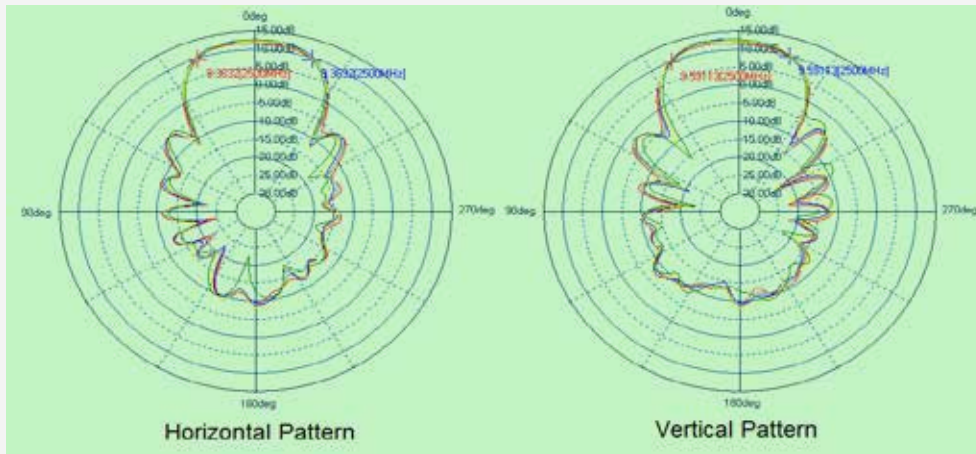


Figure 5-3 Radiation pattern of port 2 on the 27011619 antenna

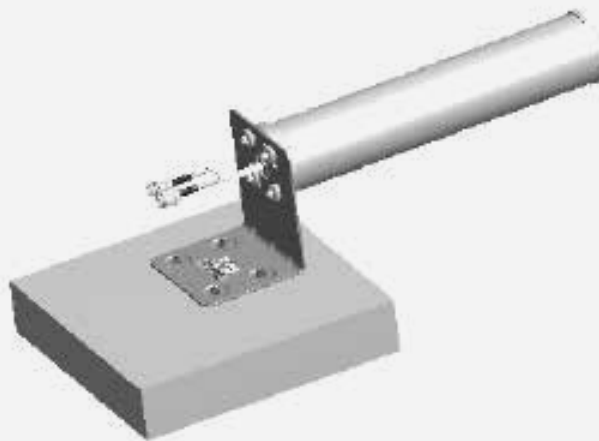


5.2 2.4 GHz Dual-Polarized Directional Antenna

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

- 5.2.1 Antenna Appearance

Figure 5-4 Appearance of the 27012048 antenna



- 5.2.2 Technical Specifications

Table 5-2 Technical specifications of the 27012048 antenna

Item	Value
Frequency (MHz)	2400-2500
Gain (dBi)	12
Horizontal lobe width (degrees)	35
Vertical lobe width (degree)	35
Standing wave ratio (SWR)	≤ 2
Polarization	Vertical and horizontal polarization
Connector	2 x N-female
Dimensions (mm)	Diameter x Length: ϕ 84 x 385
Weight (g)	1220
Support pole diameter (mm)	ϕ 25- ϕ 50
Mounting mode	Wall mounting
Applicable AP	AP8130DN/AP8150DN/AP9131DN/AP9132DN

NOTE: 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.

- 5.2.3 Antenna Pattern

The following figures show radiation patterns of two ports on the 27012048 antenna in the horizontal and vertical directions.

Figure 5-5 Radiation pattern of port 1 on the 27012048 antenna

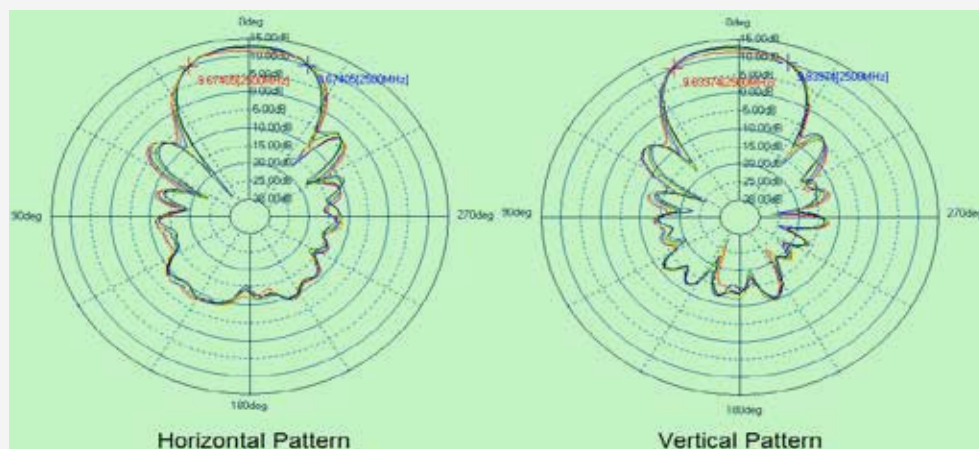
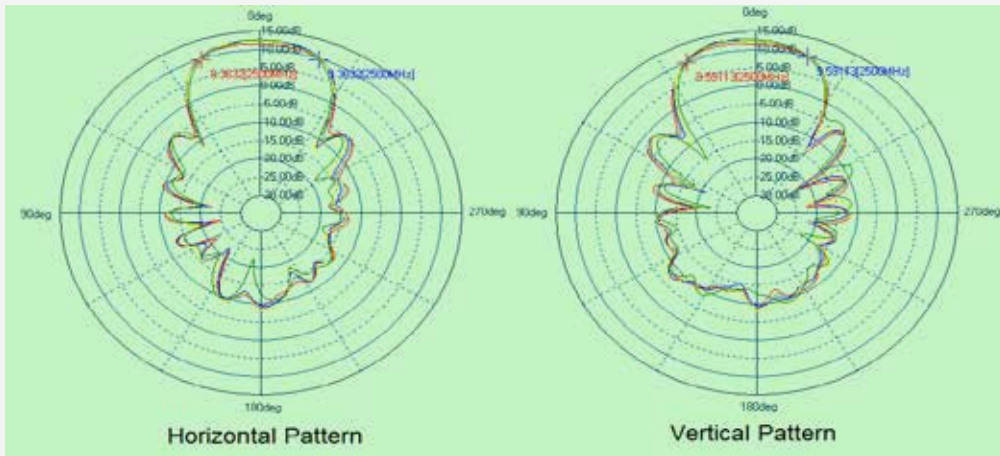


Figure 5-6 Radiation pattern of port 2 on the 27012048 antenna

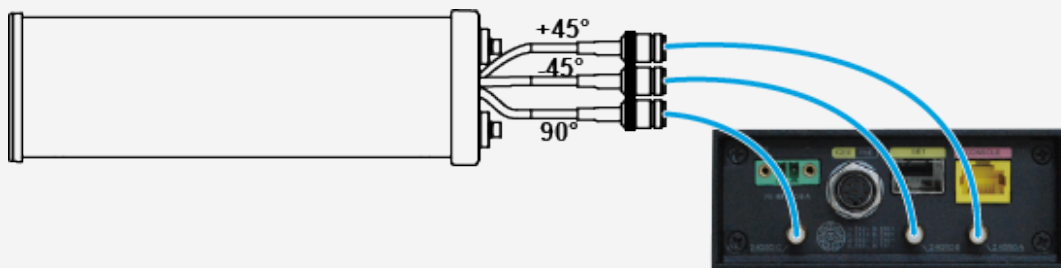


5.3 5 GHz Dual-Polarized Directional Antenna

The 27011618 antenna is a directional antenna applicable to outdoor and rail transportation scenarios.

- 5.3.1 Antenna Appearance

Figure 5-7 Appearance of the 27011618 antenna



- 5.3.2 Technical Specifications

Table 5-3 Technical specifications of the 27011618 antenna

Item	Value
Frequency (MHz)	5150–5850
Gain (dBi)	14
Horizontal lobe width (degrees)	30
Vertical lobe width (degrees)	30
Standing wave ratio (SWR)	≤ 2
Polarization	Vertical polarization and ± 45 -degree polarization
Connector	3 x N-female
Dimensions (mm)	Diameter x Length: $\phi 84 \times 257$
Weight (g)	1220
Support pole diameter (mm)	$\phi 25$ - $\phi 50$
Mounting mode	Pole mounting
Applicable AP	AP8130DN/AP8150DN/AP9131DN/AP9132DN

NOTE: 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.

- 5.3.3 Antenna Pattern

Figure 5-8, Figure 5-9, and Figure 5-10 show radiation patterns of three ports on the 27011618 antenna in the horizontal and vertical directions.

Figure 5-8 Radiation pattern of port 1 on the 27011618 antenna

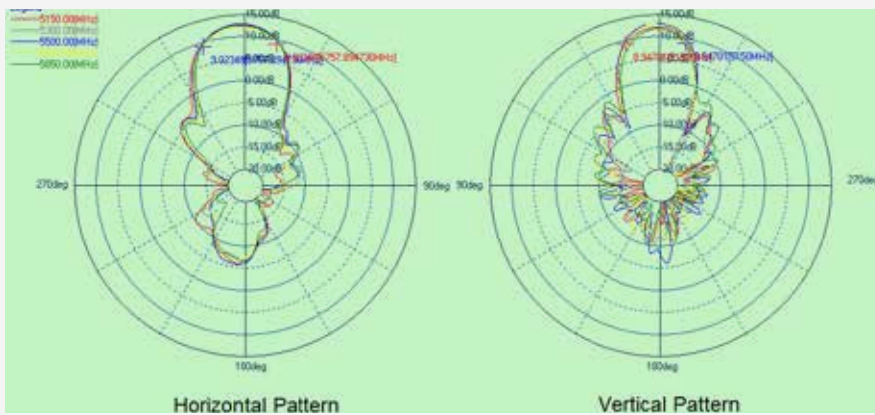


Figure 5-9 Radiation pattern of port 2 on the 27011618 antenna

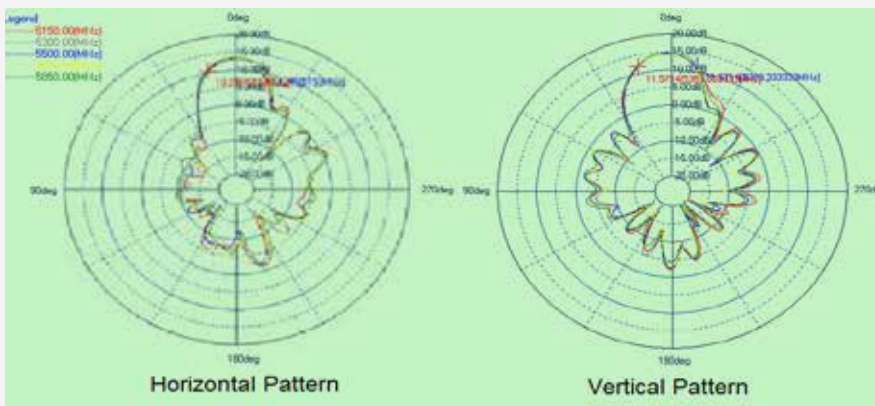
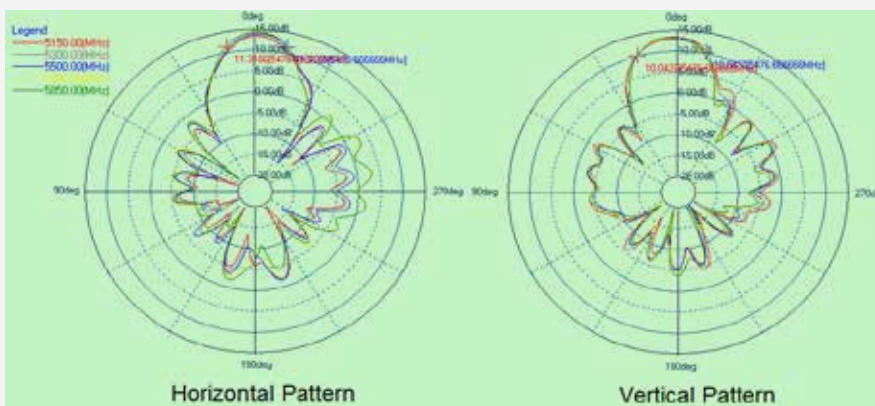


Figure 5-10 Radiation pattern of port 3 on the 27011618 antenna

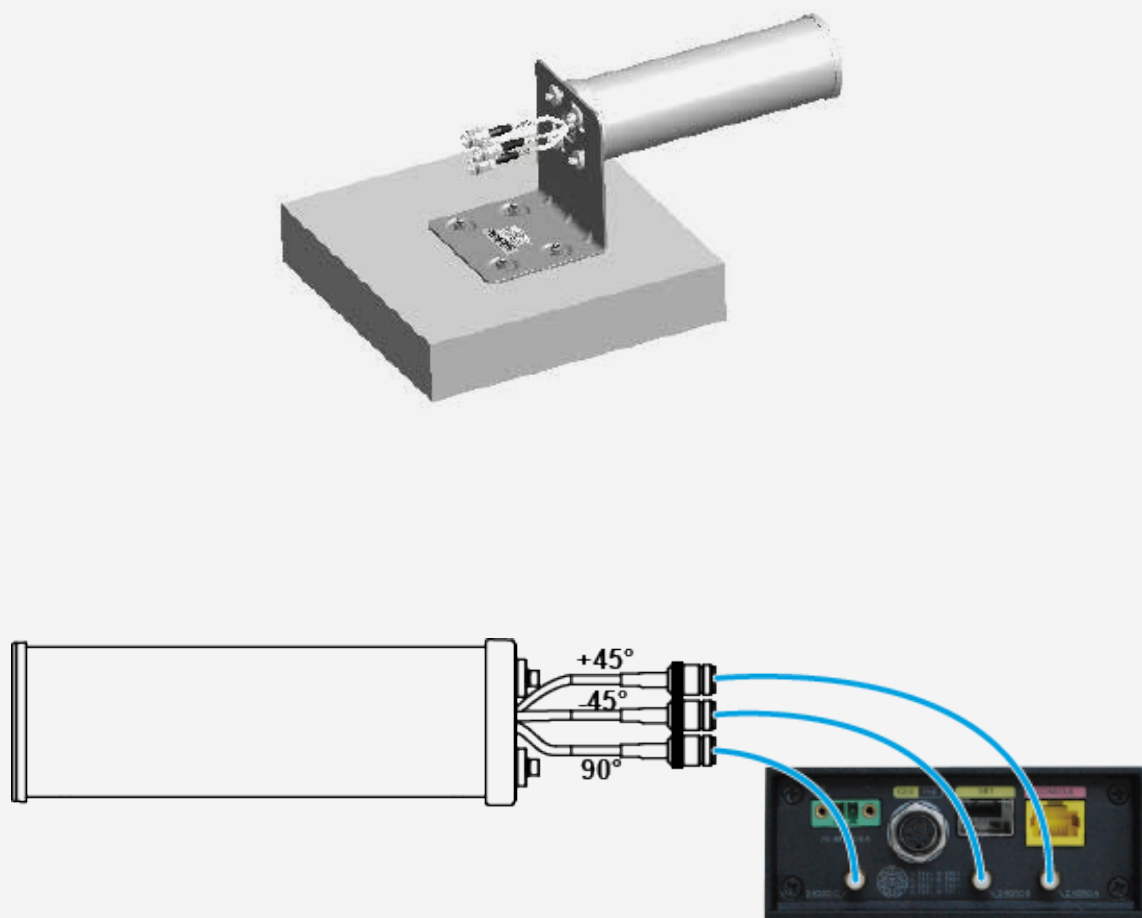


5.4 5 GHz Dual-Polarized Directional Antenna

The 27012046 antenna is a directional antenna. It can be installed on an inner wall of a tunnel and in vehicle-ground backhaul scenarios.

- 5.4.1 Antenna Appearance

Figure 5-11 Appearance of the 27012046 antenna



- 5.4.2 Technical Specifications

Table 5-4 Technical specifications of the 27012046 antenna

Item	Value
Frequency (MHz)	5150-5850
Gain (dBi)	14
Horizontal lobe width (degrees)	30
Vertical lobe width (degree)	30
Standing wave ratio (SWR)	≤ 2
Polarization	Vertical and cross polarization
Connector	3 x N-female
Dimensions (mm)	Diameter x Length: ϕ 84 x 257
Weight (g)	1220
Mounting mode	Wall mounting
Applicable AP	AP8130DN/AP8150DN/AP9131DN/AP9132DN

NOTE: 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.

- 5.4.3 Antenna Pattern

The following figures show radiation patterns of three ports on the 27012046 antenna in the horizontal and vertical directions.

Figure 5-12 Radiation pattern of port 1 on the 27012046 antenna

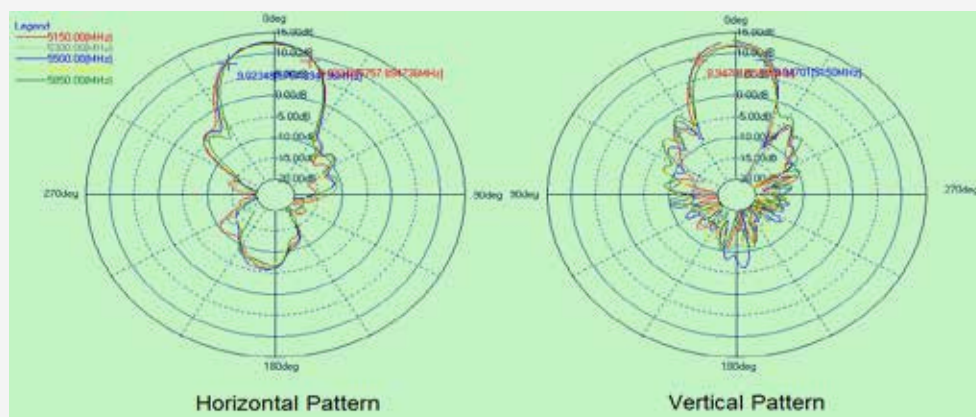


Figure 5-13 Radiation pattern of port 2 on the 27012046 antenna

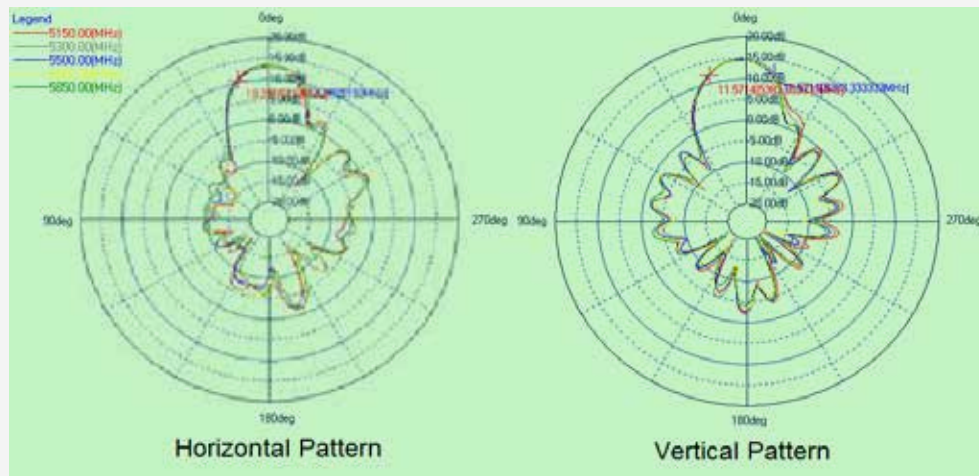
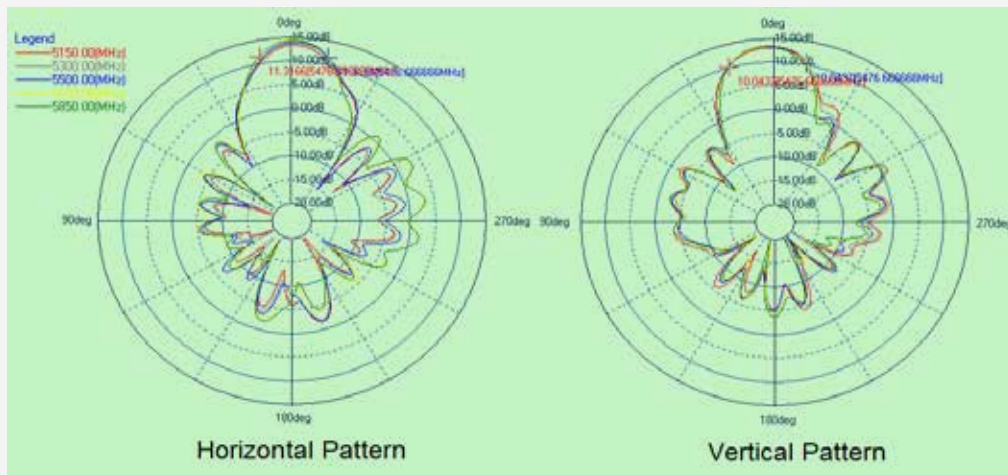


Figure 5-14 Radiation pattern of port 3 on the 27012046 antenna

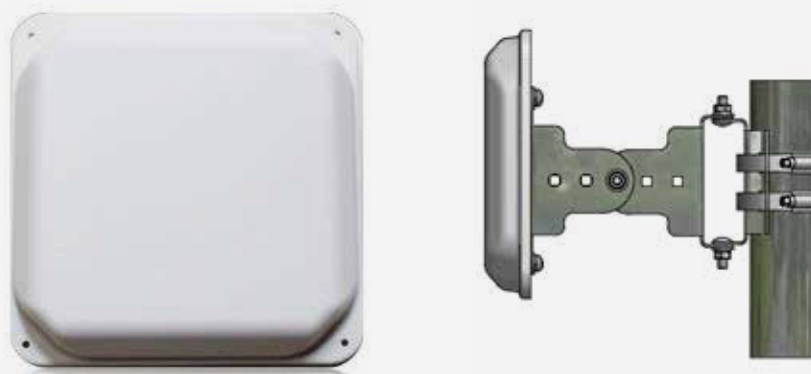


5.5 5 GHz Dual-Polarized Directional Antenna

The 27012140 directional antenna is applicable to outdoor and indoor scenarios. When it is installed indoors, it applies to scenarios that require small coverage angles but long coverage distances. Typical scenarios include corridors in hospitals or airports. When it is installed outdoors, it should be installed at high positions away from metal obstacles, for example, building tops, mountaintops, and tower tops, to obtain better performance. Its transmit end should not be blocked by obstacles.

- 5.5.1 Antenna Appearance

Figure 5-15 Appearance of the 27012140 antenna



- 5.5.2 Technical Specifications

Table 5-5 Technical specifications of the 27012140 antenna

Item	Value
Frequency (MHz)	5150–5850
Gain (dBi)	13
Coverage distance (m)	260
Backhaul distance (m)	2500
Horizontal lobe width (degrees)	33
Vertical lobe width (degree)	33
Standing wave ratio (SWR)	≤ 2
Polarization	Vertical polarization and ± 45 -degree polarization
Connector	N-female*3

Item	Value
Dimensions (mm)	H x W x D: 197.5 x 197.5 x 34.5
Weight (g)	1200
Support pole diameter (mm)	35–114
Mounting mode	Wall mounting or pole mounting
Applicable AP	AP8130DN/AP8150DN/AP9131DN/AP9132DN

NOTE: The coverage distance and backhaul distance are reference values 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.

• 5.5.3 Antenna Pattern

The following figures show radiation patterns of the 27012140 antenna in the horizontal and vertical directions.

Figure 5-16 Radiation pattern of port 1 on the 27012140 antenna

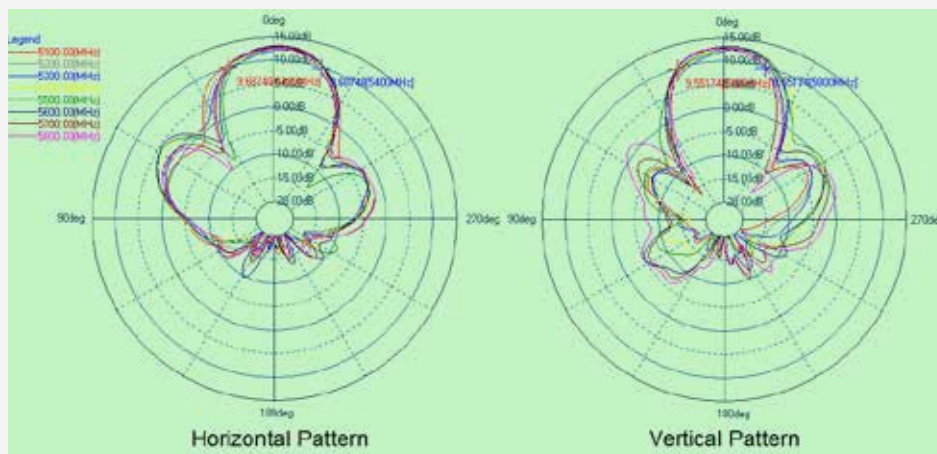


Figure 5-17 Radiation pattern of port 2 on the 27012140 antenna

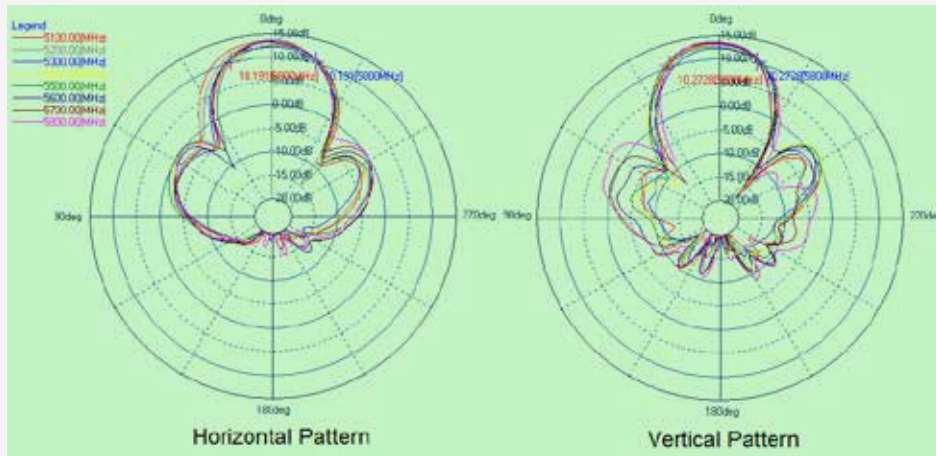
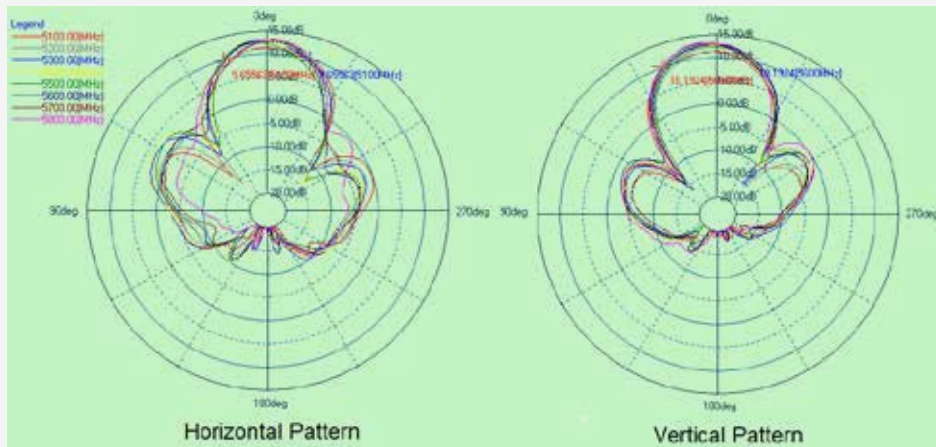




Figure 5-18 Radiation pattern of port 3 on the 27012140 antenna



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