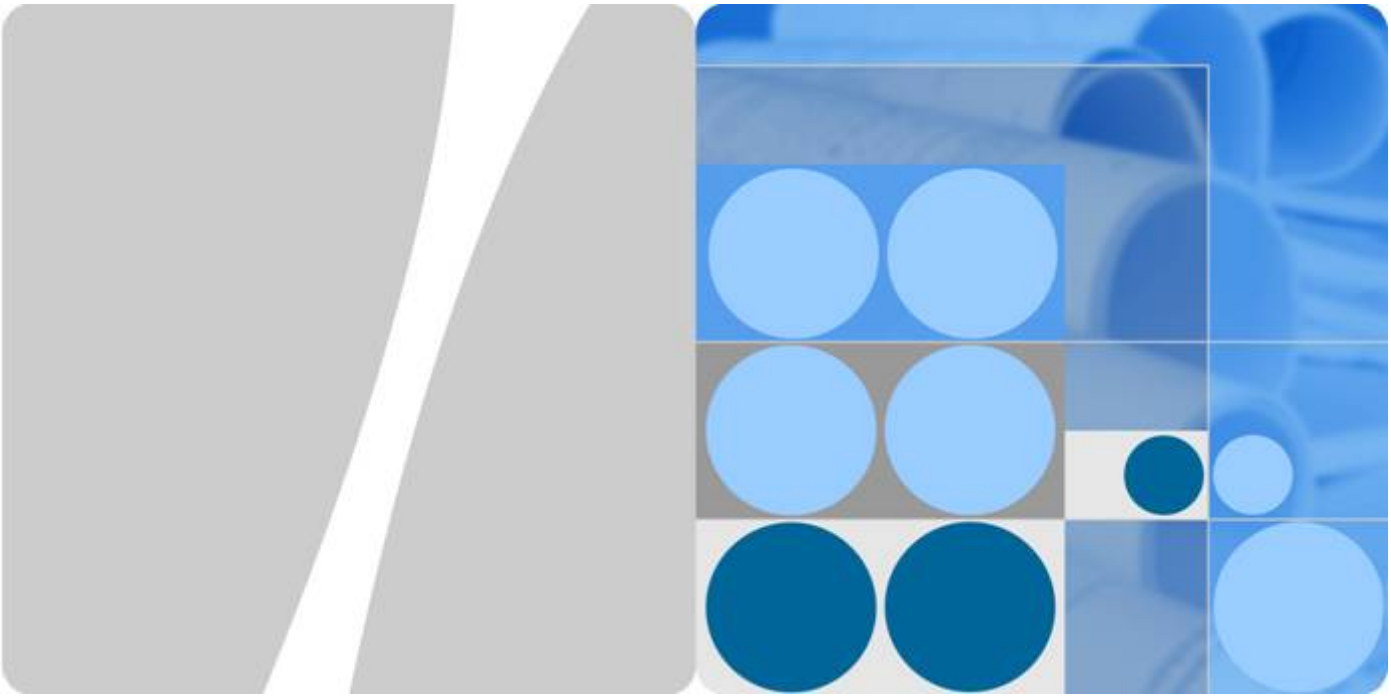

AP7050DE

Product Description

Issue 05

Date 2017-04-20

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About This Document

Purpose

This document describes the positioning, characteristics, hardware structure, product features, and technical specifications of the AP.

This document helps you understand the characteristics and features of the AP.

Intended Audience

This document is intended for network engineers responsible for network design and deployment. You should understand your network well, including the network topology and service requirements.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in previous issues.

Changes in Issue 05 (2017-04-20)

This version has the following updates:

The following information is modified:

- **3.3 QoS Features**

Changes in Issue 04 (2016-11-22)

This version has the following updates:

The following information is modified:

- **5.1 Basic Specifications**
- **5.2 Radio Specifications**

Changes in Issue 03 (2016-10-15)

This version has the following updates:

The following information is added:

- **4 Product Features (in Cloud-based Management Mode)**

The following information is modified:

- **1.1 Product Positioning**
- **2.1 AP7050DE**
- **3 Product Features (in Fat AP and Fit AP Modes)**

Changes in Issue 02 (2016-07-22)

This version has the following updates:

The following information is modified:

- **5.2 Radio Specifications**

Changes in Issue 01 (2016-05-31)

This is the initial commercial release.

Contents

1 Product Positioning and Characteristics

1.1 Product Positioning

Table 1-1 Product positioning

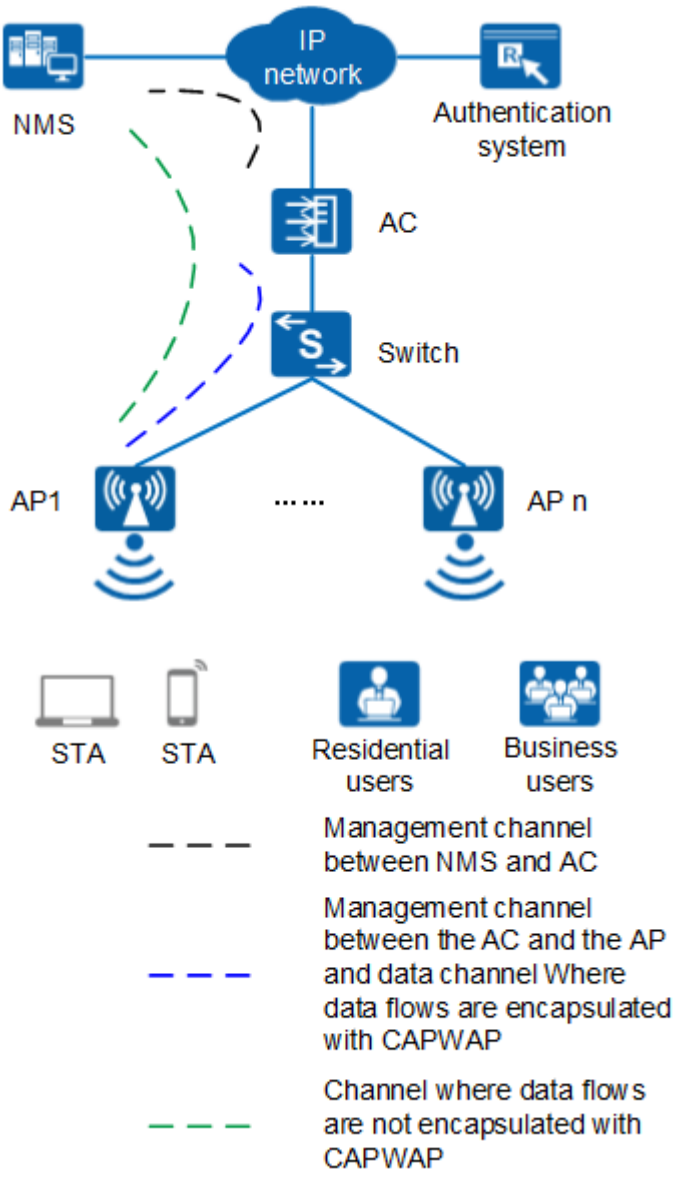
Product Model	Frequency Band	IEEE Standards Compliance	Positioning	Usage Scenario
AP7050DE	Dual band: ● 2.4 GHz ● 5 GHz The AP7050DE can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users.	IEEE 802.11a/b/g/n/ac/ac Wave 2	The AP7050DE is the next-generation technology-leading AP. It supports 4×4 MU-MIMO and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. In compliance with IEEE 802.11ac, it supports a theoretical rate of up to 2.53 Gbit/s, greatly improving user experience.	It provides high quality wireless services for large- and medium-sized enterprises in high-density scenarios, such as mobile office, elementary education, and higher education. The AP7050DE provides flexible distribution options in different environments.

Product Model	Frequency Band	IEEE Standards Compliance	Positioning	Usage Scenario
			It also has a built-in Bluetooth module providing the Bluetooth location function.	

The AP7050DE can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

Figure 1-1 Fit AP networking (AP mode)



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP go-online, AP management, authentication, routing, security, and QoS. Huawei products that provide the AC function include the AC6605, AC6005, ACU2 (with S7700, S9700, or S12700), S5720HI, S6720HI, S7700 (with X series board), S9700 (with X series board), and S12700 (with X series board).

Figure 1-2 Fit AP networking (WDS mode: point-to-point)

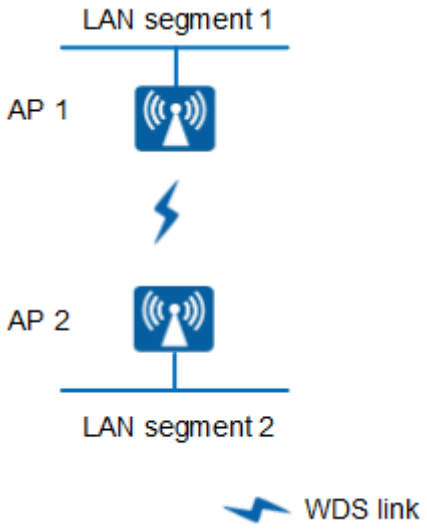
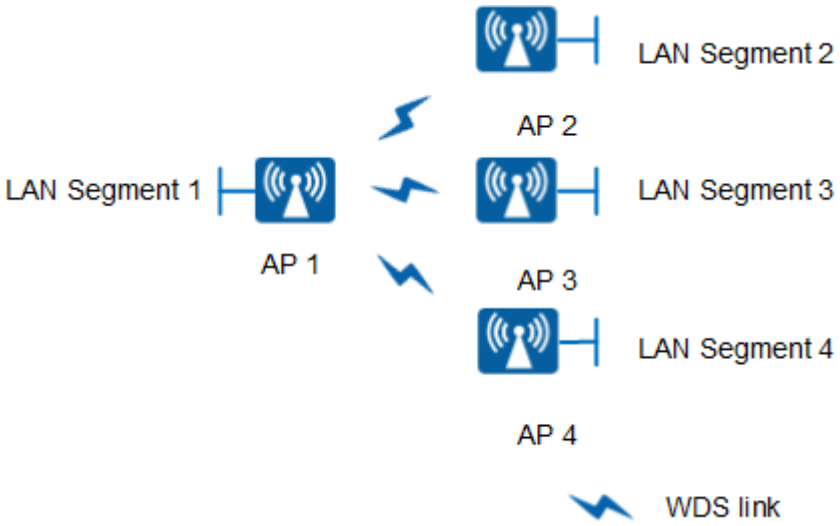
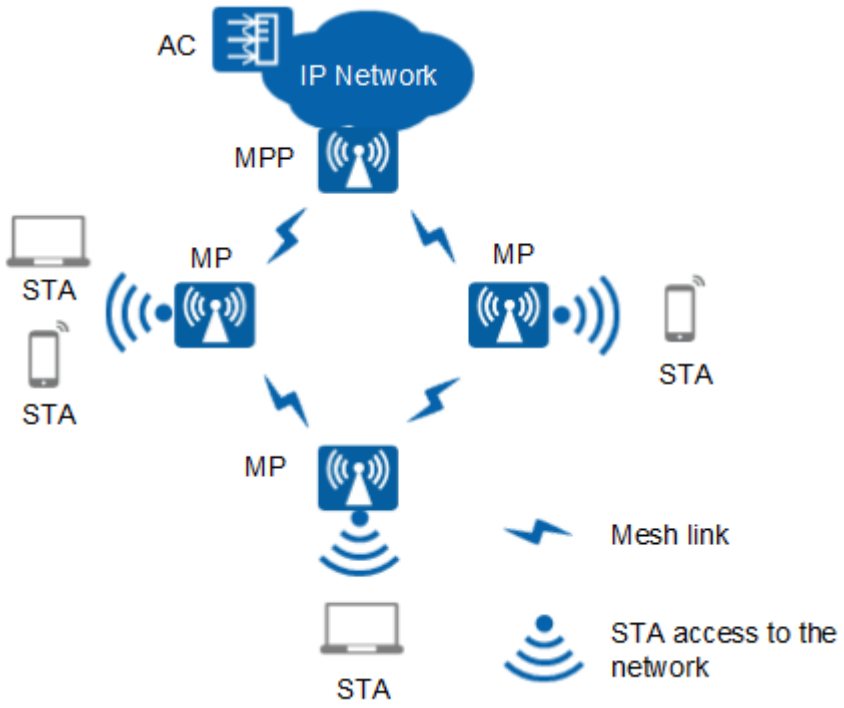


Figure 1-3 Fit AP networking (WDS mode: point-to-multipoint)



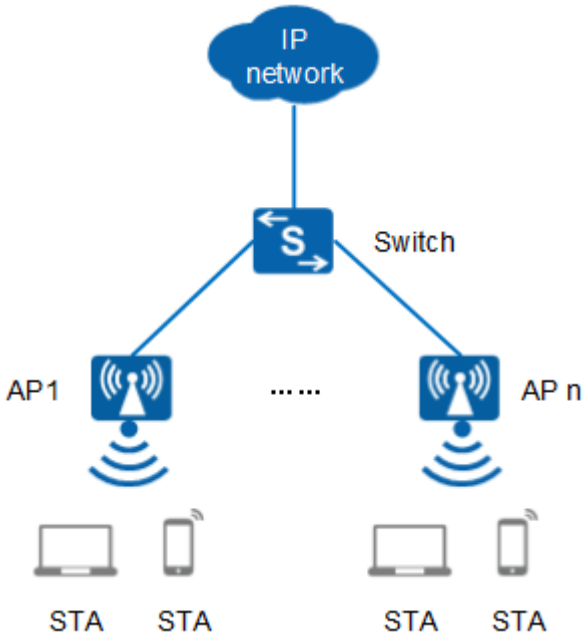
In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

Figure 1-4 Fit AP mesh networking



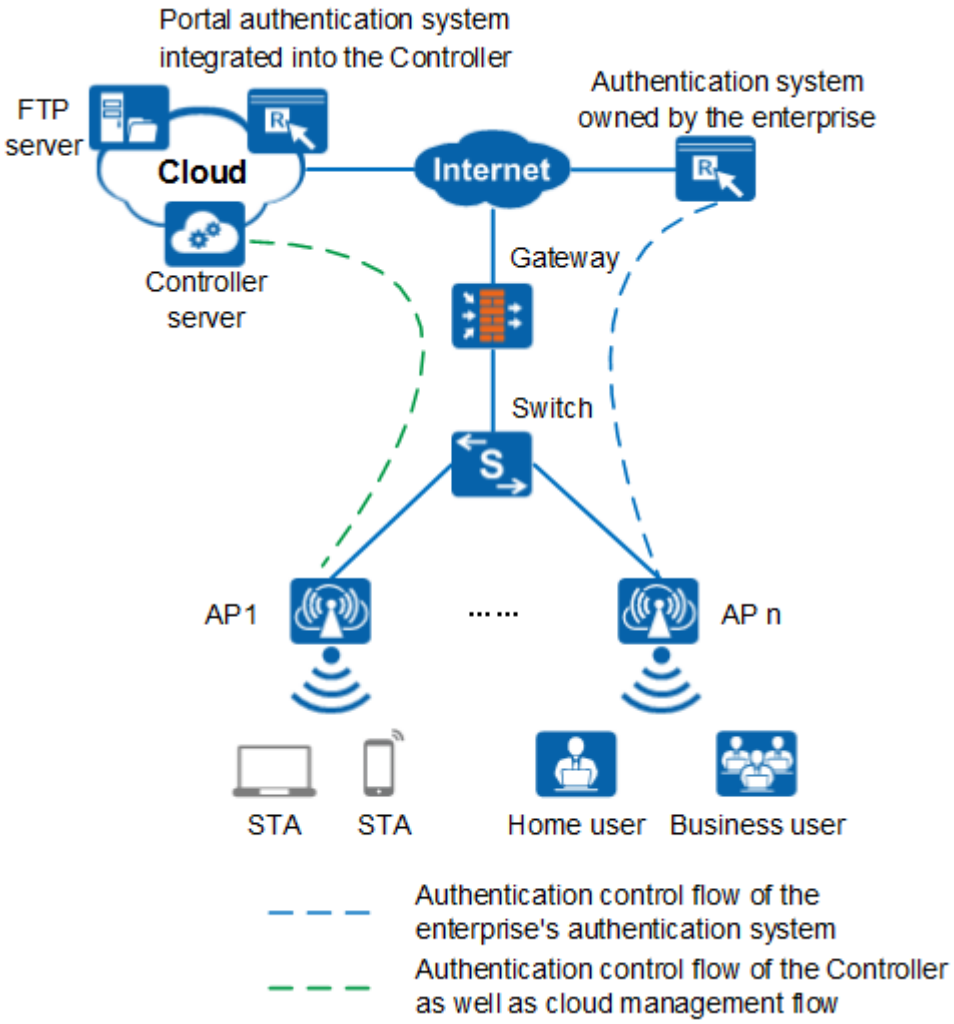
In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

Figure 1-5 Fat AP networking



In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

Figure 1-6 Cloud AP networking



In this networking, the device functions as a cloud AP and works with the Agile Controller-Campus on the same cloud for user access, AP online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the Agile Controller-Campus or the authentication server deployed by itself.

1.2 Product Characteristics

The AP7050DE has the following advantages on a WLAN.

Product Characteristics	Description
High-speed and reliable wireless access	● Compatibility with IEEE 802.11a/b/g/n/ac/ac Wave 2 ● Supports HT80+HT80 4SU-4MU MU-MIMO and a rate up to 2.53 Gbit/s. ● Supports a rate of up to 800 Mbit/s at 2.4 GHz frequency band. ● Supports a rate of up to 1.73 Gbit/s at 5 GHz frequency band. ● Supports link aggregation of dual Ethernet ports. ● Supports Wi-Fi Multimedia (WMM) and priority mapping on the air interface and wired interface. ● Supports wired link integrity check. ● Supports load balancing. ● Supports roaming without service interruption in Fit AP mode. ● Supports AC dual-link backup in Fit AP mode. ● Supports beamforming. ● Provides a latest 802.11ac Wave 2 chip with higher performance and wider coverage.
Comprehensive user access control capability	● Supports access control lists (ACLs) and implements user access control based on the user group policy. ● Provides fine-grained bandwidth management for each user. ● Supports user isolation policies. ● Supports unified authentication on the AC in Fit AP mode. ● Identifies the device type according to the organizationally unique identifier (OUI) in the MAC address, user agent (UA) information in an HTTP packet, and DHCP options in Fit AP mode. ● The RADIUS server delivers packet forwarding, security, and QoS policies according to the device type carried in the RADIUS authentication and accounting packets in Fit AP mode.
High network security	● Open system authentication ● WEP authentication/encryption ● WPA/WPA2-PSK authentication and encryption ● WPA/WPA2-802.1x authentication and encryption ● Wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS), including rogue device detection and countermeasure, attack detection and dynamic blacklist, and STA/AP blacklist and whitelist

Product Characteristics	Description
Flexible networking and environment adaptability	● Provides flexible networking capabilities and applies to various application scenarios. ● Has strong environment adaptability. The AP can automatically select the transmission rates, channels, and transmit power to adapt to various radio environments and avoid interference in real time. ● Adjusts bandwidth allocation based on the user quantity and environment to improve user experience. ● Supports the MIMO antenna system with built-in dual-band smart antennas. ● Works in Fit AP mode to identify interference sources such as baby monitors, Bluetooth devices, digital cordless phones (at 2.4 GHz frequency band only), wireless audio transmitters (at both the 2.4 GHz and 5 GHz frequency bands), wireless game controllers, and microwaves, and works together with eSight to display spectrums of interference sources.
Easy device management and maintenance	● Works in Fit AP mode to support automatic going-online, configuration loading, and plug-and-play (PnP). ● Supports batch upgrade. ● Works in Fat AP mode to support HTTP or HTTPS login to the web platform to achieve local management and maintenance. ● Allows real-time monitoring on the network management system (NMS) to facilitate remote configuration and fast fault location. ● Supports the Link Layer Discovery Protocol (LLDP) to implement automatic link discovery and obtain the network topology.

2 Hardware Structure

2.1 AP7050DE

Appearance

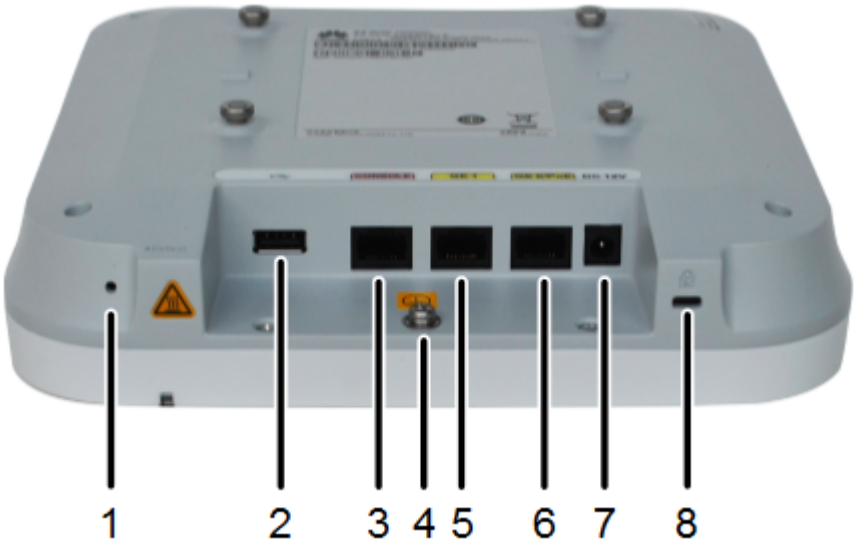
NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

Figure 2-1 AP7050DE appearance

Port

Figure 2-2 AP7050DE ports



As shown in **Figure 2-2**, each port can be described as follows:

1. Default button: restores factory settings if you hold down the button more than 3 seconds.
2. USB port: connects to a USB flash drive to extend the storage space of the AP, and provides a maximum of 2.5 W power.
3. Console port: connects to the maintenance terminal for AP configuration and management.
4. Ground screw: connects the AP to a ground cable.
5. GE1: 10/100/1000M port used to connect to the wired Ethernet.
6. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
7. Input port for 12 V DC power supply.
8. Lock port: protects the AP against theft.

LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

Type	Color	Status	Description
Default status after power-on	Green	Steady on	The AP is just powered on and the software is not started yet.

Type	Color	Status	Description
Software startup status	Green	Steady on after blinking once	After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green.
Running status	Green	Blinking once every 2s (0.5 Hz)	● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP. ● The system enters the Uboot CLI.
		Blinking once every 5s (0.2 Hz)	The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state.

Type	Color	Status	Description
Alarm	Green	Blinking once every 0.25s (4 Hz)	● The software is being upgraded. ● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online. ● The AP works in Fit AP or cloud-based management mode and fails to go online.
Fault	Red	Steady on	A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually.

3 Product Features (in Fat AP and Fit AP Modes)

3.1 WLAN Features

WLAN features supported by the AP are as follows:

- Compliance with IEEE 802.11a/b/g/n/ac/ac Wave 2
- Maximum rate of 2.53 Gbit/s
- Maximum ratio combining (MRC)
- Space time block code (STBC)
- Beamforming
- MU-MIMO
- Low-density parity-check (LDPC)
- Maximum-likelihood detection (MLD)
- Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx)
- 802.11 dynamic frequency selection (DFS)
- Short guard interval (GI) in 20 MHz, 40 MHz, 80 MHz, 160 MHz, and 80+80 MHz modes
- Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding
- Automatic and manual rate adjustment
- WLAN channel management and channel rate adjustment

  NOTE

  For details about WLAN channel management, see the *Country Code & Channel Compliance Table*.
- Automatic channel scanning and interference avoidance
- Service set identifier (SSID) hiding
- Signal sustain technology (SST)
- Unscheduled automatic power save delivery (U-APSD)
- Control and Provisioning of Wireless Access Points (CAPWAP) in Fit AP mode

- Automatic login in Fit AP mode
- Extended Service Set (ESS) in Fit AP mode
- Wireless distribution system (WDS) in Fit AP mode
- Mesh networking in Fit AP mode
- Multi-user CAC

3.2 Network Features

Network features supported by the AP are as follows:

- Compliance with IEEE 802.3ab
- Auto-negotiation of the rate and duplex mode and automatic switchover between the Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X)
- Compliance with IEEE 802.1q
- SSID-based VLAN assignment
- VLAN trunk on uplink Ethernet ports
- Management channel of the AP uplink port in tagged and untagged mode
- DHCP client, obtaining IP addresses through DHCP
- Tunnel data forwarding and direct data forwarding
- STA isolation in the same VLAN
- Access control lists (ACLs)
- Link Layer Discovery Protocol (LLDP)
- Uninterrupted service forwarding upon CAPWAP channel disconnection in Fit AP mode
- Unified authentication on the AC in Fit AP mode
- AC dual-link backup in Fit AP mode
- Network Address Translation (NAT) in Fat AP mode
- IPv6 in Fit AP mode

3.3 QoS Features

QoS features supported by the AP are as follows:

- Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding
- WMM parameter management for each radio
- WMM power saving
- Priority mapping for upstream packets and flow-based mapping for downstream packets
- Queue mapping and scheduling
- User-based bandwidth limiting
- Adaptive bandwidth management (automatic bandwidth adjustment based on the user quantity and radio environment) to improve user experience
- Smart Application Control (SAC) in Fit AP mode

3.4 Security Features

Security features supported by the AP are as follows:

- Open system authentication
- WEP authentication/encryption using a 64-bit, 128-bit, or 152-bit encryption key
- WPA/WPA2-PSK authentication and encryption (WPA/WPA2 personal edition)
- WPA/WPA2-802.1x authentication and encryption (WPA/WPA2 enterprise edition)
- WPA-WPA2 hybrid authentication
- Wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS), including rogue device detection and countermeasure, attack detection and dynamic blacklist, and STA/AP blacklist and whitelist
- 802.1x authentication, MAC address authentication, and Portal authentication
- DHCP snooping
- Dynamic ARP Inspection (DAI)
- IP Source Guard (IPSG)

3.5 Maintenance Features

Maintenance features supported by the AP are as follows:

- Unified management and maintenance on the AC in Fit AP mode
- Automatic login and configuration loading, and plug-and-play (PnP) in Fit AP mode
- Batch upgrade in Fit AP mode
- Telnet
- STelnet using SSH v2
- SFTP using SSH v2
- Local AP management through the serial interface
- Web local AP management through HTTP or HTTPS in Fat AP mode
- Real-time configuration monitoring and fast fault location using the NMS
- SNMP v1/v2/v3 in Fat AP mode
- System status alarm
- Network Time Protocol (NTP) in Fat AP mode

3.6 BYOD

NOTE

The AP supports bring your own device (BYOD) only in Fit AP mode.

BYOD features supported by the AP are as follows:

- Identifies the device type according to the organizationally unique identifier (OUI) in the MAC address.

- Identifies the device type according to the user agent (UA) information in an HTTP packet.
- Identifies the device type according to DHCP options.
- The RADIUS server delivers packet forwarding, security, and QoS policies according to the device type carried in the RADIUS authentication and accounting packets.

3.7 Locating Service

NOTE

The AP supports the locating service only in Fit AP mode.

Locating service features supported by the AP are as follows:

- Locates tags manufactured by AeroScout or Ekahau.
- Locates Wi-Fi terminals.
- Works with eSight to locate rogue devices.
- Supports Bluetooth location.

3.8 Spectrum Analysis

NOTE

The AP supports spectrum analysis only in Fit AP mode.

Spectrum analysis features supported by the AP are as follows:

- Identifies interference sources such as baby monitors, Bluetooth devices, digital cordless phones (at 2.4 GHz frequency band only), wireless audio transmitters (at both the 2.4 GHz and 5 GHz frequency bands), wireless game controllers, and microwaves.
- Works with eSight to perform spectrum analysis on interference sources.

4 Product Features (in Cloud-based Management Mode)

The following table lists features supported by APs in cloud-based management mode.

Features	Description
WLAN Features	● Compliance with IEEE 802.11a/b/g/n/ac/ac Wave 2 ● Maximum rate of 2.53 Gbit/s ● Maximum ratio combining (MRC) ● Space time block code (STBC) ● Beamforming ● Low-density parity-check (LDPC) ● Maximum-likelihood detection (MLD) ● Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx) ● 802.11 dynamic frequency selection (DFS) ● Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding ● WLAN channel management and channel rate adjustment **NOTE** For details about WLAN channel management, see the *Country Code & Channel Compliance Table*. ● Automatic channel scanning and interference avoidance ● Service set identifier (SSID) hiding ● Signal sustain technology (SST) ● Unscheduled automatic power save delivery (U-APSD) ● Automatic login

Features	Description
Network Features	● Compliance with IEEE 802.3ab ● Auto-negotiation of the rate and duplex mode and automatic switchover between the Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) ● Compliance with IEEE 802.1q ● SSID-based VLAN assignment ● DHCP client, obtaining IP addresses through DHCP ● STA isolation in the same VLAN ● Access control lists (ACLs) ● Unified authentication on the Agile Controller-Campus ● Network Address Translation (NAT)
QoS Features	● Priority mapping and packet scheduling based on a Wi-Fi Multimedia (WMM) profile to implement priority-based data processing and forwarding ● WMM parameter management for each radio ● WMM power saving ● Priority mapping for upstream packets and flow-based mapping for downstream packets ● Queue mapping and scheduling ● User-based bandwidth limiting ● Airtime scheduling
Security Features	● Open system authentication ● WEP authentication/encryption using a 64-bit, 128-bit, or 152-bit encryption key ● WPA2-PSK authentication and encryption (WPA2 personal edition) ● WPA2-802.1x authentication and encryption (WPA2 enterprise edition) ● WPA-WPA2 hybrid authentication ● 802.1x authentication, MAC address authentication, and Portal authentication ● DHCP snooping ● Dynamic ARP Inspection (DAI) ● IP Source Guard (IPSG)

Features	Description
Maintenance Features	● Unified management and maintenance on the Agile Controller-Campus ● Automatic login and configuration loading, and plug-and-play (PnP) ● Batch upgrade ● Telnet ● STelnet using SSH v2 ● SFTP using SSH v2 ● Local AP management through the serial interface ● Web local AP management through HTTP or HTTPS ● Real-time configuration monitoring and fast fault location using the NMS ● System status alarm ● Network Time Protocol (NTP)

5 Technical Specifications

5.1 Basic Specifications

Table 5-1 Basic specifications

Item		Description
Technical specifications	Dimensions (H x W x D)	53 mm x 220 mm x 220 mm
	Weight	1.3 kg
	System memory	● 512 MB DDR3L ● 4 MB NOR FLASH + 128 MB NAND FLASH
Power specifications	Power input	● DC: 12 V ± 10% ● PoE power supply: in compliance with IEEE 802.3at
	Maximum power consumption	24 W(excluding the output power of the USB port) **NOTE** The actual maximum power consumption depends on local laws and regulations.
Environment specifications	Operating temperature	● -60 m to +1800 m: -10°C to +50°C ● 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m.
	Storage temperature	-40°C to +70°C
	Operating humidity	5% to 95% (non-condensing)
	IP rating	IP41
	Atmospheric pressure	53 kPa to 106 kPa

5.2 Radio Specifications

Table 5-2 Radio specifications

Item	Description		
Antenna type	Built-in dual-band smart antenna (hardware)		
Antenna gain	● 2.4 GHz: 2dBi ● 5 GHz: 3dBi		
Maximum number of users	FIT AP: ≤ 512 FAT AP: ≤ 512 Cloud AP: ≤ 512		
Maximum number of VAPs for each radio	16		
Maximum transmit power	● 2.4 GHz: 26 dBm (combined power) ● 5 GHz: 27 dBm (combined power) **NOTE** The actual transmit power depends on local laws and regulations.		
Maximum number of non-overlapping channels	2.4 GHz (2.412 GHz to 2.472 GHz) ● 802.11b/g – 20 MHz: 3 ● 802.11n – 20 MHz: 3 – 40 MHz: 1	5 GHz (5.18 GHz to 5.825 GHz) ● 802.11a – 20 MHz: 13 ● 802.11n – 20 MHz: 13 – 40 MHz: 6 ● 802.11ac – 20MHz: 13 – 40MHz: 6 – 80MHz: 3 – 160MHz: 1	**NOTE** The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. **NOTICE** If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage. 1. The country code of the AP is fixed. 2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.

Item	Description
Channel rate supported	● 802.11b: 1, 2, 5.5, and 11 Mbit/s ● 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s ● 802.11n: 6.5 to 800 Mbit/s ● 802.11ac wave2: 6.5 to 1733.3 Mbit/s

Item	Description			
Receiver sensitivity (Typical values)	2.4 GHz 802.11b ● -104 dBm @ 1 Mbit/s ● -100 dBm @ 2 Mbit/s ● -100 dBm @ 5.5 Mbit/s ● -97 dBm @ 11 Mbit/s	2.4 GHz 802.11g ● -97 dBm @ 6 Mbit/s ● -97 dBm @ 9 Mbit/s ● -96 dBm @ 12 Mbit/s ● -95 dBm @ 18 Mbit/s ● -91 dBm @ 24 Mbit/s ● -89 dBm @ 36 Mbit/s ● -84 dBm @ 48 Mbit/s ● -78 dBm @ 54 Mbit/s	2.4 GHz 802.11n (HT20) ● -97 dBm @ MCS0 ● -95 dBm @ MCS1 ● -93 dBm @ MCS2 ● -89 dBm @ MCS3 ● -86 dBm @ MCS4 ● -83 dBm @ MCS5 ● -81 dBm @ MCS6 ● -79 dBm @ MCS7 ● -95 dBm @ MCS8 ● -93 dBm @ MCS9 ● -91 dBm @ MCS10 ● -87 dBm @ MCS11 ● -84 dBm @ MCS12 ● -81 dBm @ MCS13 ● -79 dBm @ MCS14 ● -77 dBm @ MCS15 ● -93 dBm @ MCS16 ● -91 dBm @ MCS17 ● -89 dBm @ MCS18 ● -85 dBm @ MCS19 ● -82 dBm @ MCS20	2.4 GHz 802.11n(HT40) ● -95 dBm @ MCS0 ● -92 dBm @ MCS1 ● -90 dBm @ MCS2 ● -87 dBm @ MCS3 ● -84 dBm @ MCS4 ● -80 dBm @ MCS5 ● -79 dBm @ MCS6 ● -77 dBm @ MCS7 ● -93 dBm @ MCS8 ● -90 dBm @ MCS9 ● -88 dBm @ MCS10 ● -85 dBm @ MCS11 ● -82 dBm @ MCS12 ● -78 dBm @ MCS13 ● -77 dBm @ MCS14 ● -75 dBm @ MCS15 ● -91 dBm @ MCS16 ● -88 dBm @ MCS17 ● -86 dBm @ MCS18 ● -83 dBm @ MCS19 ● -80 dBm @ MCS20

Item	Description			
			• -79 dBm @ MCS21 • -77 dBm @ MCS22 • -75 dBm @ MCS23 • -91 dBm @ MCS24 • -89 dBm @ MCS25 • -87 dBm @ MCS26 • -83 dBm @ MCS27 • -80 dBm @ MCS28 • -77 dBm @ MCS29 • -75 dBm @ MCS30 • -73 dBm @ MCS31	• -76 dBm @ MCS21 • -75 dBm @ MCS22 • -73 dBm @ MCS23 • -89 dBm @ MCS24 • -86 dBm @ MCS25 • -84 dBm @ MCS26 • -81 dBm @ MCS27 • -78 dBm @ MCS28 • -74 dBm @ MCS29 • -73 dBm @ MCS30 • -71 dBm @ MCS31

Item	Description			
	5 GHz 802.11a ● -97 dBm @ 6 Mbit/s ● -97 dBm @ 9 Mbit/s ● -95 dBm @ 12 Mbit/s ● -93 dBm @ 18 Mbit/s ● -89 dBm @ 24 Mbit/s ● -86 dBm @ 36 Mbit/s ● -83 dBm @ 48 Mbit/s ● -79 dBm @ 54 Mbit/s	5 GHz 802.11n (HT20) ● -97 dBm @ MCS0 ● -94 dBm @ MCS1 ● -92 dBm @ MCS2 ● -87 dBm @ MCS3 ● -83 dBm @ MCS4 ● -81 dBm @ MCS5 ● -80 dBm @ MCS6 ● -78 dBm @ MCS7 ● -95 dBm @ MCS8 ● -92 dBm @ MCS9 ● -90 dBm @ MCS10 ● -85 dBm @ MCS11 ● -81 dBm @ MCS12 ● -79 dBm @ MCS13 ● -78 dBm @ MCS14 ● -76 dBm @ MCS15 ● -93 dBm @ MCS16 ● -90 dBm @ MCS17 ● -88 dBm @ MCS18 ● -83 dBm @ MCS19 ● -79 dBm @ MCS20	5 GHz 802.11n (HT40) ● -94 dBm @ MCS0 ● -91 dBm @ MCS1 ● -88 dBm @ MCS2 ● -84 dBm @ MCS3 ● -81 dBm @ MCS4 ● -77 dBm @ MCS5 ● -75 dBm @ MCS6 ● -74 dBm @ MCS7 ● -92 dBm @ MCS8 ● -89 dBm @ MCS9 ● -86 dBm @ MCS10 ● -82 dBm @ MCS11 ● -79 dBm @ MCS12 ● -75 dBm @ MCS13 ● -73 dBm @ MCS14 ● -72 dBm @ MCS15 ● -90 dBm @ MCS16 ● -87 dBm @ MCS17 ● -84 dBm @ MCS18 ● -80 dBm @ MCS19 ● -77 dBm @ MCS20	-

Item	Description			
		• -77 dBm @ MCS21 • -76 dBm @ MCS22 • -74 dBm @ MCS23 • -91 dBm @ MCS24 • -88 dBm @ MCS25 • -86 dBm @ MCS26 • -81 dBm @ MCS27 • -77 dBm @ MCS28 • -75 dBm @ MCS29 • -74 dBm @ MCS30 • -72 dBm @ MCS31	• -73 dBm @ MCS21 • -71 dBm @ MCS22 • -70 dBm @ MCS23 • -88 dBm @ MCS24 • -85 dBm @ MCS25 • -82 dBm @ MCS26 • -78 dBm @ MCS27 • -75 dBm @ MCS28 • -71 dBm @ MCS29 • -69 dBm @ MCS30 • -68 dBm @ MCS31	

Item	Description			
	5 GHz 802.11ac (VHT20) ● -97 dBm @ MCS0NSS1 ● -94 dBm @ MCS1NSS1 ● -92 dBm @ MCS2NSS1 ● -87 dBm @ MCS3NSS1 ● -83 dBm @ MCS4NSS1 ● -81 dBm @ MCS5NSS1 ● -80 dBm @ MCS6NSS1 ● -77 dBm @ MCS7NSS1 ● -76 dBm @ MCS8NSS1 ● -95 dBm @ MCS0NSS2 ● -92 dBm @ MCS1NSS2 ● -90 dBm @ MCS2NSS2 ● -85 dBm @ MCS3NSS2 ● -81 dBm @ MCS4NSS2 ● -79 dBm @ MCS5NSS2 ● -78 dBm @ MCS6NSS2 ● -75 dBm @ MCS7NSS2 ● -74 dBm @ MCS8NSS2 ● -93 dBm @ MCS0NSS3 ● -90 dBm @ MCS1NSS3	5 GHz 802.11ac (VHT40) ● -94 dBm @ MCS0NSS1 ● -91 dBm @ MCS1NSS1 ● -88 dBm @ MCS2NSS1 ● -84 dBm @ MCS3NSS1 ● -81 dBm @ MCS4NSS1 ● -77 dBm @ MCS5NSS1 ● -75 dBm @ MCS6NSS1 ● -74 dBm @ MCS7NSS1 ● -73 dBm @ MCS8NSS1 ● -72 dBm @ MCS9NSS1 ● -92 dBm @ MCS0NSS2 ● -89 dBm @ MCS1NSS2 ● -86 dBm @ MCS2NSS2 ● -82 dBm @ MCS3NSS2 ● -79 dBm @ MCS4NSS2 ● -75 dBm @ MCS5NSS2 ● -73 dBm @ MCS6NSS2 ● -72 dBm @ MCS7NSS2 ● -70 dBm @ MCS8NSS2 ● -69 dBm @ MCS9NSS2	5 GHz 802.11ac (VHT80) ● -90 dBm @ MCS0NSS1 ● -87 dBm @ MCS1NSS1 ● -84 dBm @ MCS2NSS1 ● -80 dBm @ MCS3NSS1 ● -77 dBm @ MCS4NSS1 ● -73 dBm @ MCS5NSS1 ● -71 dBm @ MCS6NSS1 ● -70 dBm @ MCS7NSS1 ● -68 dBm @ MCS8NSS1 ● -67 dBm @ MCS9NSS1 ● -88 dBm @ MCS0NSS2 ● -85 dBm @ MCS1NSS2 ● -82 dBm @ MCS2NSS2 ● -78 dBm @ MCS3NSS2 ● -75 dBm @ MCS4NSS2 ● -71 dBm @ MCS5NSS2 ● -69 dBm @ MCS6NSS2 ● -68 dBm @ MCS7NSS2 ● -65 dBm @ MCS8NSS2 ● -64 dBm @ MCS9NSS2	5 GHz 802.11ac (VHT160) ● -85 dBm @ MCS0NSS1 ● -82 dBm @ MCS1NSS1 ● -80 dBm @ MCS2NSS1 ● -76 dBm @ MCS3NSS1 ● -73 dBm @ MCS4NSS1 ● -68 dBm @ MCS5NSS1 ● -67 dBm @ MCS6NSS1 ● -66 dBm @ MCS7NSS1 ● -62 dBm @ MCS8NSS1 ● -60 dBm @ MCS9NSS1 ● -83 dBm @ MCS0NSS2 ● -80 dBm @ MCS1NSS2 ● -78 dBm @ MCS2NSS2 ● -74 dBm @ MCS3NSS2 ● -71 dBm @ MCS4NSS2 ● -66 dBm @ MCS5NSS2 ● -65 dBm @ MCS6NSS2 ● -64 dBm @ MCS7NSS2 ● -60 dBm @ MCS8NSS2 ● -58 dBm @ MCS9NSS2

Item	Description			
	● -88 dBm @ MCS2NSS3 ● -83 dBm @ MCS3NSS3 ● -79 dBm @ MCS4NSS3 ● -77 dBm @ MCS5NSS3 ● -76 dBm @ MCS6NSS3 ● -73 dBm @ MCS7NSS3 ● -72 dBm @ MCS8NSS3 ● -70 dBm @ MCS9NSS3 ● -91 dBm @ MCS0NSS4 ● -88 dBm @ MCS1NSS4 ● -86 dBm @ MCS2NSS4 ● -81 dBm @ MCS3NSS4 ● -77 dBm @ MCS4NSS4 ● -75 dBm @ MCS5NSS4 ● -74 dBm @ MCS6NSS4 ● -71 dBm @ MCS7NSS4 ● -70 dBm @ MCS8NSS4	● -90 dBm @ MCS0NSS3 ● -87 dBm @ MCS1NSS3 ● -84 dBm @ MCS2NSS3 ● -80 dBm @ MCS3NSS3 ● -77 dBm @ MCS4NSS3 ● -73 dBm @ MCS5NSS3 ● -71 dBm @ MCS6NSS3 ● -70 dBm @ MCS7NSS3 ● -67 dBm @ MCS8NSS3 ● -66 dBm @ MCS9NSS3 ● -88 dBm @ MCS0NSS4 ● -85 dBm @ MCS1NSS4 ● -82 dBm @ MCS2NSS4 ● -78 dBm @ MCS3NSS4 ● -75 dBm @ MCS4NSS4 ● -71 dBm @ MCS5NSS4 ● -69 dBm @ MCS6NSS4 ● -68 dBm @ MCS7NSS4 ● -65 dBm @ MCS8NSS4 ● -64 dBm @ MCS9NSS4	● -86 dBm @ MCS0NSS3 ● -83 dBm @ MCS1NSS3 ● -80 dBm @ MCS2NSS3 ● -76 dBm @ MCS3NSS3 ● -73 dBm @ MCS4NSS3 ● -69 dBm @ MCS5NSS3 ● -66 dBm @ MCS7NSS3 ● -64 dBm @ MCS8NSS3 ● -63 dBm @ MCS9NSS3 ● -84 dBm @ MCS0NSS4 ● -81 dBm @ MCS1NSS4 ● -78 dBm @ MCS2NSS4 ● -74 dBm @ MCS3NSS4 ● -71 dBm @ MCS4NSS4 ● -67 dBm @ MCS5NSS4 ● -65 dBm @ MCS6NSS4 ● -64 dBm @ MCS7NSS4 ● -62 dBm @ MCS8NSS4 ● -61 dBm @ MCS9NSS4	

5.3 Standards Compliance

Safety Standards

- UL 60950 - 1
- CAN/CSA 22.2 No.60950-1
- IEC 60950 - 1
- EN 60950 - 1
- GB 4943

Radio Standards

- ETSI EN 300 328
- ETSI EN 301 893
- FCC Part 15C: 15.247
- FCC Part 15C: 15.407
- RSS-210
- AS/NZS 4268

EMC Standards

- EN 301 489 - 1
- EN 301 489 - 17
- ETSI EN 60601-1-2
- FCC Part 15
- ICES-003
- YD/T 1312.2-2004
- ITU k.20
- GB 9254
- GB 17625.1
- AS/NZS CISPR22
- EN 55022
- EN 55024
- CISPR 22
- CISPR 24
- IEC61000-4-6
- IEC61000-4-2

IEEE Standards

- IEEE 802.11a/b/g
- IEEE 802.11n
- IEEE 802.11ac

- IEEE 802.11h
- IEEE 802.11d
- IEEE 802.11e

Security Standards

- 802.11i, Wi-Fi Protected Access 2 (WPA2), and WPA
- 802.1X
- Advanced Encryption Standards (AES) and Temporal Key Integrity Protocol (TKIP)
- EAP Type (s)

EMF

- CENELEC EN 62311
- CENELEC EN 50385
- OET65
- RSS-102
- FCC Part1&2
- FCC KDB series

RoHS

- Directive 2002/95/EC & 2011/65/EU

Reach

- Regulation 1907/2006/EC

WEEE

- Directive 2002/96/EC & 2012/19/EU