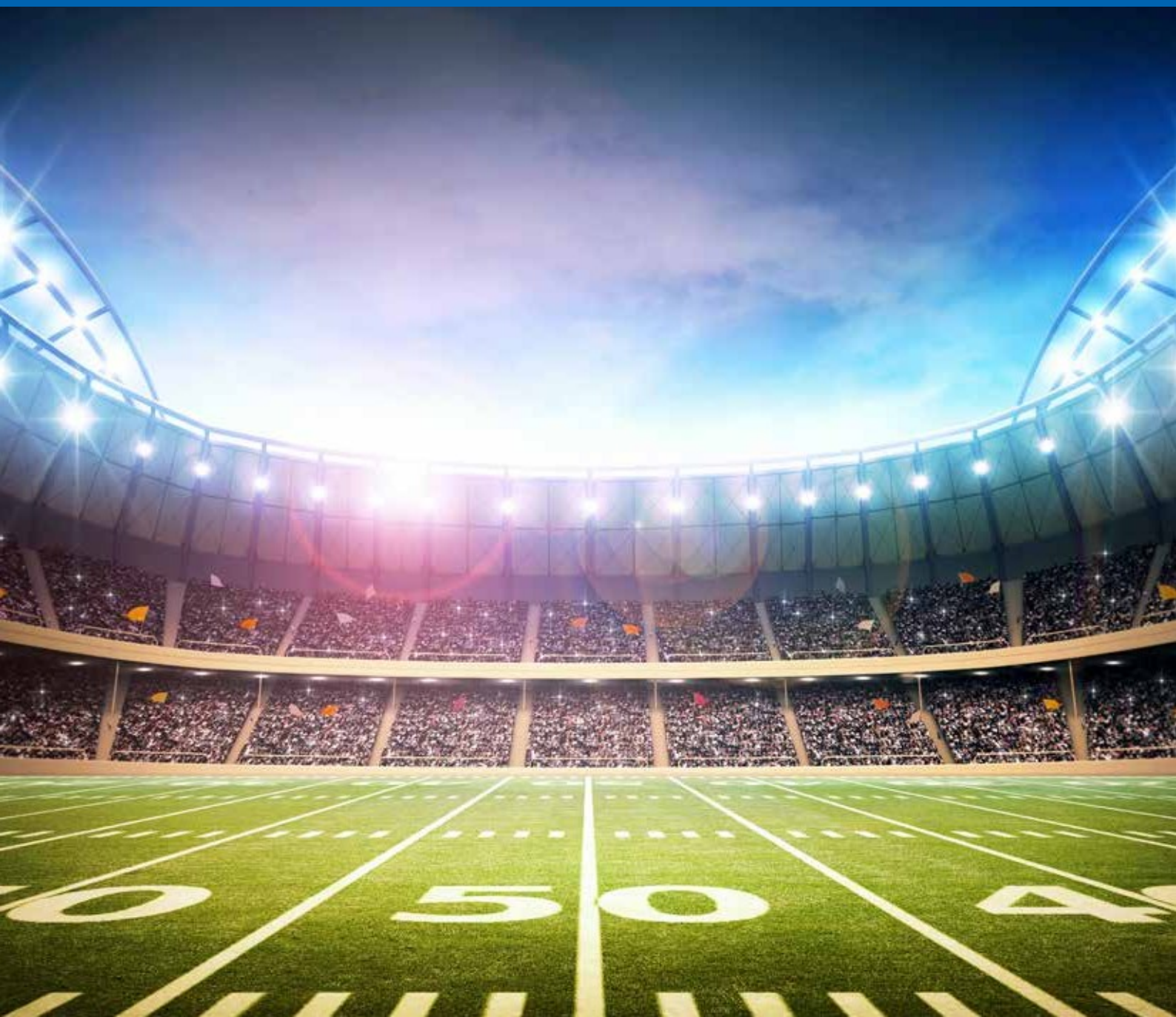
Huawei

AP4050DN-HD

Access Point

Datasheet



Product Overview

Huawei AP4050DN-HD is a wireless access point that supports 802.11ac Wave 2, 2 x 2 MIMO, and two spatial streams. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets network deployment requirements. The AP complies with 802.11n and 802.11ac protocols and can provide gigabit access for wireless users. It has built-in smart high-density antennas and therefore provides more precise wireless coverage, applicable to indoor high-density stadiums.

AP4050DN-HD

- 802.11ac Wave 2 compliance, MU-MIMO (2SU-2MU), delivering services simultaneously on 2.4G and 5G radios (400 Mbit/s at 2.4 GHz, 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device).
- Embedded with smart antennas purpose-built for high-density scenarios. These antennas can reduce construction costs and mitigate interference between APs.
- Dual Ethernet interfaces support link aggregation and traffic load balancing to ensure link reliability. The Ethernet interface GE0 supports the PoE in function. When the AP uses 802.3at PoE power supply, the Ethernet interface GE1 supports the PoE out function and can be used to provide power for other devices.
- Supports the Fat, Fit, and cloud modes and enables Huawei cloud-based management platform to manage and operate APs and services on the APs, reducing network O&M costs.

Feature Descriptions

Smart high-density antenna

Embedded with smart antennas purpose-built for high-density scenarios, the AP is easy to install, reducing network deployment costs. The directional coverage can mitigate interference between APs, meeting high-density coverage requirements of indoor stadiums.

PoE out function

When the AP uses 802.3at PoE power supply, the Ethernet interface GE1 supports the PoE out function and can be used to provide power for other devices.

MU-MIMO

The AP supports MU-MIMO. MU-MIMO technology allows an AP to send data to multiple STAs at the same time (currently, most 802.11n/11ac Wave 1 APs can only send data to one STA simultaneously). The technology marks the start of the 802.11ac Wave 2 era.

GE access

The APs support the 80-MHz bandwidth mode. Frequency bandwidth increase brings extended channels and more sub-carriers for data transmission, and a 2.16-fold rate increase. Support for High Quadrature Amplitude Modulation (HQAM) at 256-QAM increases the 5 GHz radio rate to 867 Mbit/s and the AP rate to 1.267 Gbit/s.

Cloud-based management

Huawei Cloud Managed Network (CMN) Solution consists of the cloud management platform and a full range of cloud managed network devices. The cloud management platform provides various functions including management of APs, tenants, applications, and licenses, network planning and optimization, device monitoring, network service configuration, and value-added services.

High Density Boost technology

Huawei uses the following technologies to address challenges in high-density scenarios, including access problems, data congestion, and poor roaming experience:

- Interference suppression
  - In high-density scenarios, APs are usually densely placed. Huawei uses small-angle antennas that are purpose-built for high-density scenarios to mitigate interference. These antennas have good radiation angle control and can regulate AP coverage radius to within the appropriate range. Additionally, Huawei's Clear Channel Assessment (CCA) optimization technology reduces the possibility of air interface resources shared by multiple devices, allows higher user access, and improves the throughput.
- Air interface performance optimization
  - In high-density scenarios where many users access the network, increased number of low-rate STAs consumes more resources on the air interface, reduces the AP capacity, and lowers user experience. Therefore, Huawei APs will check the signal strength of STAs during access and rejects access from weak-signal STAs. At the same time, the APs monitor the rate of online STAs in real time and forcibly disconnect low-rate STAs so that the STAs can reassociate with APs that have stronger signals. The terminal access control technology can increase air interface use efficiency and allow access from more users.
- 5G-prior access (Band steering)
  - The APs support both 2.4G and 5G frequency bands. The 5G-prior access function enables an AP to steer STAs to the 5 GHz frequency band first, which reduces load and interference on the 2.4 GHz frequency band, improving the user experience.
- Load balancing between APs
  - After the load balancing function is enabled, the AC distributes users evenly to APs based on user quantity and traffic volume. Traffic load is therefore balanced among APs to ensure stable AP performance.
- Smart roaming
  - Smart roaming technology is based on the 802.11k , 802.11v and 802.11r technologies and allows STAs to connect to APs with stronger signals, improving user experience and the overall performance of the wireless network.
- Agile Beam
  - Agile antenna polarization beam automatic adaption.

Wired and wireless dual security guarantee

To ensure data security, Huawei APs integrate wired and wireless security measures and provide comprehensive security protection.

- Authentication and encryption for wireless access
  - The APs support WEP, WPA/WPA2–PSK, WPA/WPA2–802.1x, and WAPI authentication/encryption modes to ensure security of the wireless network. The authentication mechanism is used to authenticate user identities so that only authorized users can access network resources. The encryption mechanism is used to encrypt data transmitted over wireless links to ensure that the data can only be received and parsed by expected users.
- Analysis on non-Wi-Fi interference sources
  - Huawei APs can analyze the spectrum of non-Wi-Fi interference sources and identify them, including 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 microwave ovens. Coupled with Huawei eSight, the precise locations of the interference sources can be detected, and the spectrum of them displayed, enabling the administrator to remove the interference in a timely manner.
- Rogue device monitoring
  - Huawei APs support WIDS/WIPS, and can monitor, identify, defend, counter, and perform refined management on the rogue devices, to provide security guarantees for air interface environment and wireless data transmission.
- AP access authentication and encryption
  - The AP access control ensures validity of APs. The CAPWAP link protection and DTLS encryption provide security assurance, improving data transmission security between the AP and the AC.

Automatic radio calibration

Automatic radio calibration allows an AP to collect signal strength and channel parameters of surrounding APs and generate AP topology according to the collected data. Based on interference from authorized APs, rogue APs, and non-Wi-Fi interference sources, each AP automatically adjusts its transmit power and working channel to make the network operate at the optimal performance. In this way, network reliability and user experience are improved.

Automatic application identification

Huawei APs support smart application control technology and can implement visualized control on Layer 4 to Layer 7 applications.

- Traffic identification
  - Coupled with Huawei ACs, the APs can identify over 1600 common applications in various office scenarios. Based on the identification results, policy control can be implemented on user services, including priority adjustment, scheduling, blocking, and rate limiting to ensure efficient bandwidth resource use and improve quality of key services.
- Traffic statistics collection
  - Traffic statistics of each application can be collected globally, by SSID, or by user, enabling the network administrator to know application use status on the network. The network administrator or operator can implement visualized control on service applications on smart terminals to enhance security and ensure effective bandwidth control.

Basic Specifications

Hardware specifications

Item		Description
Technical specifications	Dimensions (H x W x D)	65 mm x 240 mm x 334 mm
	Weight	1.5 kg
	Interface type	2 x 10/100/1000M self-adaptive Ethernet interface (RJ45) 1 x Management console port (RJ45)
	LED indicator	Indicates the power-on, startup, running, alarm, and fault status of the system.
Power specifications Environmental specifications	Power input	12 V DC ± 10% PoE power supply: in compliance with IEEE 802.3af/at
	Maximum power consumption	11.8 W (in 802.3af PoE or DC mode) 13.9 W (in 802.3at PoE mode, excluding the output power of the PoE_OUT port) **NOTE** The actual maximum power consumption depends on local laws and regulations.
	Operating temperature	–10°C to +50°C
Radio specifications	Storage temperature	–40°C to +70°C
	Operating humidity	5% to 95% (non-condensing)
	Dustproof and waterproof grade	IP41
	Altitude	–60 m to +5000 m
	Atmospheric pressure	53 kPa to 106 kPa
	Antenna type	Built-in dual-band directional antenna (beamwidth: 30 degrees)
	Antenna gain	2.4G: 13 dBi 5G: 10 dBi
	Maximum number of SSIDs for each radio	16
	Maximum number of users	≤ 256

Item		Description
Radio specifications	Maximum transmit power	2.4G: 22 dBm (combined power) 5G: 22 dBm (combined power) **NOTE** The actual transmit power depends on local laws and regulations.
	Power increment	1 dBm
	receiver sensitivity	2.4 GHz 802.11b：–99dBm @ 1 Mbit/s；–91dBm@ 11 Mbit/s
		2.4 GHz 802.11g：-92dBm @ 6 Mbit/s； -77dBm @ 54 Mbit/s
		2.4 GHz 802.11n (HT20)：-92 dBm @ MCS0；-72dBm @ MCS15
		2.4 GHz 802.11n(HT40)：-89 dBm @ MCS0；-70dBm @ MCS15
		5 GHz 802.11a：-92 dBm @ 6 Mbit/s； -76dBm @ 54 Mbit/s
		5 GHz 802.11n (HT20)：-92 dBm @ MCS0；-71dBm @ MCS15
		5 GHz 802.11n (HT40)：-88 dBm @ MCS0；-69dBm @ MCS15
		5 GHz 802.11ac (VTH20)：-91 dBm @ MCS0NSS1； -67 dBm @ MCS8NSS2
		5 GHz 802.11ac (VTH40)：-88 dBm @ MCS0NSS1； -63 dBm @ MCS9NSS2
		5 GHz 802.11ac (VTH80)：-85 dBm @ MCS0NSS1； -60 dBm @ MCS9NSS2

Basic Specifications

Softwarespecifications

Fat/Fit AP mode

Item	Description
WLAN features	Compliance with IEEE 802.11a/b/g/n/ac/ac Wave 2 Maximum rate: 1.267 Gbit/s Maximum ratio combining (MRC) Space time block code (STBC) Cyclic Delay Diversity (CDD)/Cyclic Shift Diversity (CSD) 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, and 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 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 Hotspot2.0 802.11k and 802.11v smart roaming 802.11r fast roaming (≤ 50 ms) WAN authentication escape. In local forwarding mode, this function retains the online state of existing STAs and allows access of new STAs when APs are disconnected from an AC, ensuring service continuity

Item	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 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 Soft Generic Routing Encapsulation (GRE) IPv6 Source Address Validation Improvements (SAVI)
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 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 Airtime scheduling Support for Microsoft Lync APIs and high voice call quality through Lync API identification and scheduling

Item	Description
Security features	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 WAPI 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 802.1x authentication, MAC address authentication, and Portal authentication DHCP snooping Dynamic ARP Inspection (DAI) IP Source Guard (IPSG) 802.11w Protected Management Frames (PMFs) Application identification
Maintenance features	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 WDS zero-configuration deployment in Fit AP mode Mesh network zero-configuration deployment 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
BYOD	**NOTE** The AP supports bring your own device (BYOD) only in Fit AP mode. 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.

Item	Description
Location service	**NOTE** The AP supports the locating service only in Fit AP mode. Locates tags manufactured by AeroScout or Ekahau. Locates Wi-Fi terminals. Works with eSight to locate rogue devices.
Spectrum analysis	**NOTE** The AP supports spectrum analysis only in Fit AP mode. 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.

Cloud-based management mode

Item	Description
WLAN features	Compliance with IEEE 802.11a/b/g/n/ac/ac Wave 2 Maximum rate: 1.267 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 detailed management channels, 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

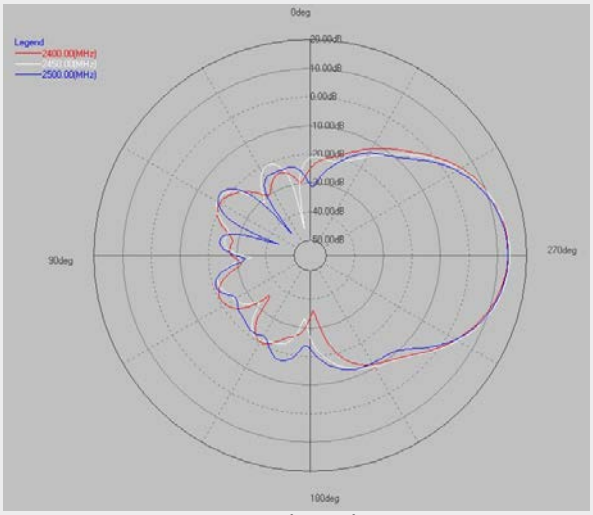
Item	Description
Network features	Compliance with IEEE 802.3ab Auto-negotiation of the rate and duplex mode and automatic switchover between the Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compliance with IEEE 802.1q SSID-based VLAN assignment DHCP client, obtaining IP addresses through DHCP STA isolation in the same VLAN Access control lists (ACLs) Unified authentication on the Agile Controller 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 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 802.1x authentication, MAC address authentication, and Portal authentication DHCP snooping Dynamic ARP Inspection (DAI) IP Source Guard (IPSG)

Item	Description
Maintenance features	Unified management and maintenance on the Agile Controller 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)

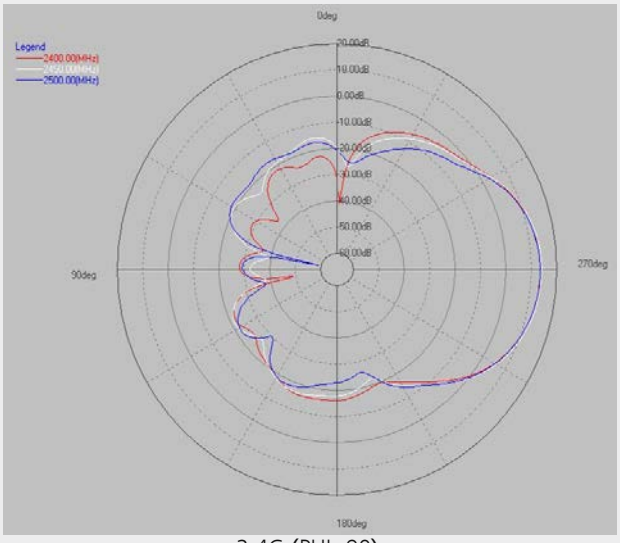
Standards compliance

Item	Description
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 IEEE 802.11k IEEE 802.11u IEEE 802.11v IEEE 802.11w IEEE 802.11r
Security standards	802.11i，Wi-Fi Protected Access 2(WPA2)，WPA 802.1X Advanced Encryption Standards(AES)，Temporal Key Integrity Protocol(TKIP) EAP Type(s)
EMF	CENELEC EN 62311 CENELEC EN 50385 OET65 RSS-102 FCC Part1&2 FCC KDB
RoHS	Directive 2002/95/EC & 2011/65/EU
Reach	Regulation 1907/2006/EC
WEEE	Directive 2002/96/EC & 2012/19/EU

AP4050DN-HD Antennas Pattern



2.4G (PHI=0)



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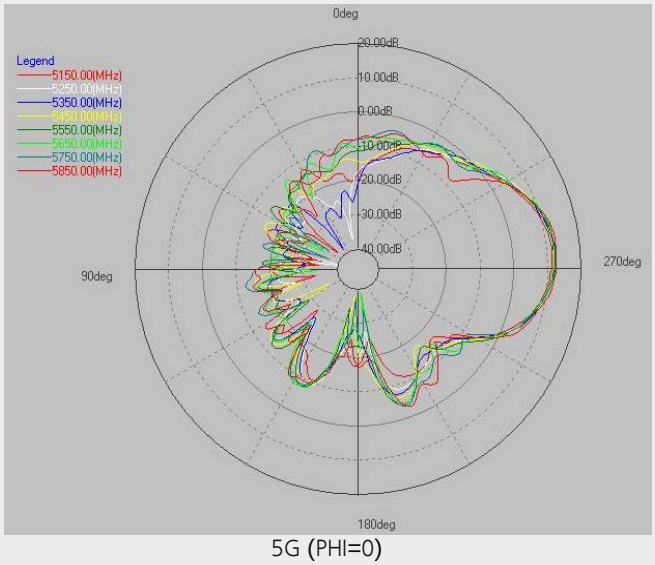
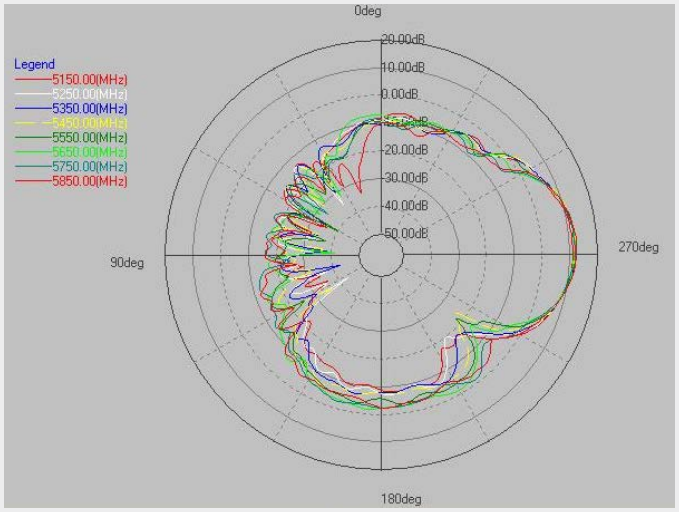


5G (PHI=0)



5G (PHI=90)

Professional Service and Support

Huawei WLAN planning tools deliver expert network design and optimization services using the most professional simulation platform in the industry. Backed by fifteen years of continuous investment in wireless technologies, extensive network planning and optimization experience, and rich expert resources, Huawei helps customers:

- Design, deploy, and operate a high-performance network that is reliable and secure.
- Maximize return on investment and reduce operating expenses.

More Information

For more information, please visit http://e.huawei.com or contact your local Huawei office.

Enterprise Services

Product Overview

Marketing Documentation

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