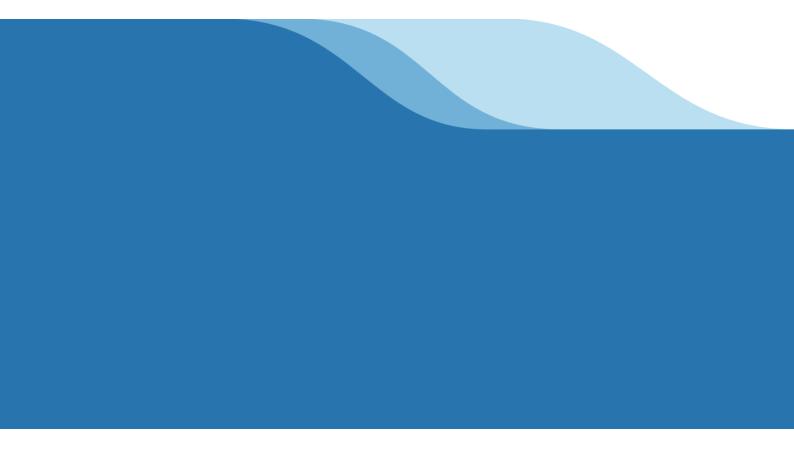# Huawei AirEngine 6576-57T Access Point Datasheet

Product Overview

Huawei AirEngine 6576-57T is a next-generation indoor access point (AP) in compliance with Wi-Fi 7 (802.11be). It can simultaneously provide services on 2.4 GHz (2x2 MIMO), 5 GHz (2x2 MIMO), and 6 GHz (4x4 MIMO) frequency bands, supporting a total of 8 spatial streams and achieving a device rate of up to 13.66 Gbps. The AP is empowered by brand-new Wi-Fi 7 technologies and is equipped with built-in smart antennas to enable always-on Wi-Fi signals for users, significantly enhancing users' wireless network experience. These strengths make the AirEngine 6576-57T ideal for densely populated scenarios such as mobile offices, schools, and stadiums.

AirEngine 6576-57T

- Provides services simultaneously on both the 2.4 GHz (2x2), 5 GHz (2x2), and 6 GHz (4x4) frequency bands, at a rate of up to 689 Mbps at 2.4 GHz, 1.44 Gbps at 5 GHz, 11.53 Gbps at 6 GHz, and 13.66 Gbps for the device.

- Has built-in smart antennas that automatically adjust the coverage direction and signal strength based on the intelligent switchover algorithm. Such capability enables the AP to flexibly adapt to the application environment changes, providing accurate and stable coverage as STAs move.

- Supports external IoT expansion for protocols, such as ZigBee and RFID, through its USB port.

- Allows for Bluetooth serial interface-based O&M through built-in Bluetooth and CloudCampus APP.

- Supports Fit and cloud management working modes, and enables Huawei cloud management platform to manage and operate APs and services on the APs, reducing network O&M costs.
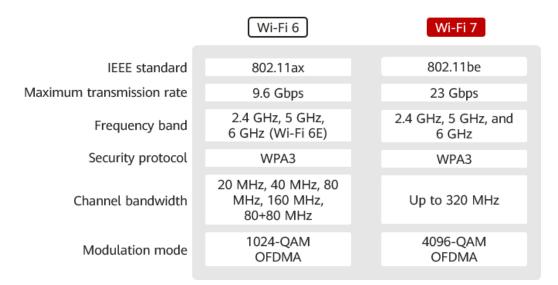
Feature Descriptions

Wi-Fi 7 (802.11be) standard

Wi-Fi 7 (802.11be) is the next-generation Wi-Fi standard to be launched, also known as IEEE 802.11be or extremely high throughput (EHT). Based on Wi-Fi 6, Wi-Fi 7 introduces technologies such as 320 MHz bandwidth, 4096-quadrature amplitude modulation (QAM), multi-resource unit (RU), multi-link operation (MLO), enhanced multi-user multiple-input multiple-output (MU-MIMO), and multi-AP coordination. Drawing on these cutting-edge technologies, Wi-Fi 7 delivers a higher data transmission rate and lower latency than Wi-Fi 6. The throughput of Wi-Fi 7 networks is expected to increase to more than 30 Gbps,   about three times that of Wi-Fi 6.

Wi-Fi 7 vs. Wi-Fi 6

Based on the Wi-Fi 6 standard, Wi-Fi 7 introduces a plurality of new technologies. The following compares Wi-Fi 6 and Wi-Fi 7.

	Wi-Fi 6	Wi-Fi 7
IEEE standard	802.11ax	802.11be
Maximum transmission rate	9.6 Gbps	23 Gbps
Frequency band	2.4 GHz, 5 GHz, 6 GHz (Wi-Fi 6E)	2.4 GHz, 5 GHz, and 6 GHz
Security protocol	WPA3	WPA3
Channel bandwidth	20 MHz, 40 MHz, 80 MHz, 160 MHz, 80+80 MHz	Up to 320 MHz
Modulation mode	1024-QAM OFDMA	4096-QAM OFDMA

📖 **NOTE**

- The maximum transmission rate of the picture is the maximum rate of a single radio. It is 5 GHz radio for Wi-Fi 6, while it is 6 GHz radio for Wi-Fi 7.

New Features in Wi-Fi 7

Wi-Fi 7 aims to increase the WLAN throughput to over 30 Gbps and provide low-latency access assurance. To achieve this goal, the standard defines modifications to both the physical layer (PHY) and MAC layer. Compared with Wi-Fi 6, Wi-Fi 7 brings the following technical innovations:

Up to 320 MHz Bandwidth

- The 2.4 GHz and 5 GHz frequency bands are unlicensed spectrums that limited and congested. When running emerging applications (such as VR/AR), existing Wi-Fi networks inevitably encounter low quality of service (QoS). To increase the maximum throughput to at least 30 Gbps, Wi-Fi 7 will support the 6 GHz of frequency band and extend new bandwidth modes, including contiguous 240 MHz, non-contiguous 160+80 MHz, contiguous 320 MHz, and non-contiguous 160+160 MHz.

Multi-RU*

- In Wi-Fi 6, each user can send or receive frames only on the RUs allocated to them, which greatly limits the flexibility of spectrum resource scheduling. To resolve this problem and further improve spectrum efficiency, Wi-Fi 7 defines a mechanism for allocating multiple RUs to a single user. To balance the implementation complexity and spectrum utilization, the standard specifications impose certain restrictions on RU combination. That is, small RUs (containing fewer than 242 tones) can be combined only with small RUs, and large RUs (containing greater than or equal to 242 tones) can be combined only with large RUs. Small RUs and large RUs cannot be combined together.

📖 **NOTE**

- Features marked with asterisks (*) can be implemented through software upgrade.

Higher-Order 4096-QAM

- The highest order modulation supported by Wi-Fi 6 is 1024-QAM, which allows each modulation symbol to carry up to 10 bits. To further improve the rate, Wi-Fi 7 introduces 4096-QAM so that each modulation symbol can carry 12 bits. With the same coding scheme, 4096-QAM in Wi-Fi 7 can achieve a 20% rate increase compared with 1024-QAM in Wi-Fi 6.

Multi-Link Mechanism

- To efficiently utilize all available spectrum resources, the industry is in urgent need to introduce new spectrum management, coordination, and transmission mechanisms on the 2.4 GHz, 5 GHz, and 6 GHz frequency bands. The TGbe defines multi-link aggregation technologies, including the MAC architecture of enhanced multi-link aggregation, multi-link channel access, and multi-link transmission.

Multi-AP Coordination*

- In the current 802.11 protocol framework, there is not much coordination between APs. Common WLAN functions, such as automatic radio calibration and smart roaming, are vendor-defined features. Multi-AP coordination aims to optimize channel selection and adjust loads between APs to achieve efficient utilization and balanced allocation of radio resources. Coordinated scheduling between multiple APs in Wi-Fi 7 involves inter-cell coordinated planning in the time and frequency domains, inter-cell interference coordination, and distributed MIMO. This reduces interference between APs and greatly improves the utilization of air interface resources.

- Multi-AP coordination can be implemented in various methods, such as coordinated orthogonal frequency division multiple access (C-OFDMA), coordinated spatial reuse (CSR), coordinated beamforming (CBF), and joint transmission (JXT).

Wi-Fi 7 Application Scenarios

New functions introduced by Wi-Fi 7 will significantly improve the data transmission rate and deliver lower latency. These highlights will contribute to the development of emerging applications:

- Video stream

- Video/Voice conference

- Online gaming

- Real-time collaboration

- Cloud/Edge computing

- Industrial IoT

- Immersive AR/VR

- Interactive telemedicine

Basic Specifications

Fit AP Mode

Item	Description
WLAN features	Compliance with IEEE 802.11be and compatibility with IEEE 802.11a/b/g/n/ac/ax
	Maximum ratio combining (MRC)Cyclic Delay Diversity (CDD)/Cyclic Shift Diversity (CSD)
	Beamforming
	Compliance with 4096-quadrature amplitude modulation (QAM) and compatibility with 1024-QAM, 256-QAM, 64-QAM, 16-QAM, 8-QAM, quadrature phase shift keying (QPSK), and binary phase shift keying (BPSK)
	Low-density parity-check (LDPC)
	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, and 160 MHz modes
	Wi-Fi multimedia (WMM) for priority mapping and scheduling
	WLAN channel management and channel rate adjustment
	Automatic channel scanning and interference avoidance
	NOTE For detailed management channels, see the *Country Codes & Channels Compliance*.
	Service set identifier (SSID) hiding configuration for each AP, supporting Chinese SSIDs

Item	Description
	Signal sustain technology (SST)
	Unscheduled automatic power save delivery (U-APSD)
	Control And Provisioning of Wireless Access Points (CAPWAP) in Fit AP mode
	Automatic onboarding in Fit AP mode
	Extended Service Set (ESS) in Fit AP mode
	Multi-user call admission control (CAC)
	Advanced cellular coexistence (ACC), minimizing the impact of interference from cellular networks
	802.11k and 802.11v smart roaming
	802.11r fast roaming (≤ 50 ms)
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
	Uplink VLAN trunks on Ethernet ports
	Management channel of the AP's 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
	IP access control lists (ACLs)
	Link Layer Discovery Protocol (LLDP)
	Service holding upon CAPWAP link disconnection in Fit AP mode
	Unified authentication on the AC in Fit AP mode
	AC dual-link backup in Fit AP mode
	Telemetry in Fit AP mode, quickly collecting AP status and application experience parameters
QoS features	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
	Airtime scheduling
	Air interface HQoS scheduling
Security features	Open system authentication
	WPA2-PSK authentication and encryption (WPA2-Personal)
	WPA2-802.1X authentication and encryption (WPA2-Enterprise)

Item	Description
	WPA3-SAE authentication and encryption (WPA3-Personal)
	WPA3-802.1X authentication and encryption (WPA3-Enterprise)
	WPA-WPA2 hybrid authentication
	WPA2-WPA3 hybrid authentication
	WPA2-PPSK authentication and encryption in Fit AP mode
	Wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS), including rogue device detection and containment, attack detection and dynamic blacklist, and STA/AP blacklist and whitelist
	802.1X authentication, MAC address authentication, and Portal authentication
	DHCP snooping
	802.11w Protected Management Frames (PMF)
Maintenance features	Unified management and maintenance on the AC in Fit AP mode
	Automatic onboarding, automatic configuration loading, and plug-and-play (PnP) in Fit AP mode
	Automatic batch upgrade in Fit AP mode
	STelnet using SSHv2
	SFTP using SSHv2
	Remote wireless O&M through the Bluetooth serial interface
	System status alarm

Cloud-based Management Mode

Item	Description
WLAN features	Compliance with IEEE 802.11be and compatibility with IEEE 802.11a/b/g/n/ac/ax
	Maximum ratio combining (MRC)
	Cyclic Delay Diversity (CDD)/Cyclic Shift Diversity (CSD)
	Beamforming
	Compliance with 4096-quadrature amplitude modulation (QAM) and compatibility with 1024-QAM, 256-QAM, 64-QAM, 16-QAM, 8-QAM, quadrature phase shift keying (QPSK), and binary phase shift keying (BPSK)
	Low-density parity-check (LDPC)
	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, and 160 MHz modes
	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 Codes & Channels Compliance*.
	Automatic channel scanning and interference avoidance

Item	Description
	Service set identifier (SSID) hiding configuration for each AP, supporting Chinese SSIDs Signal sustain technology (SST)
	Unscheduled automatic power save delivery (U-APSD)
	Automatic AP onboarding
	802.11k and 802.11v smart roaming
	802.11r fast roaming (≤ 50 ms)
	Advanced cellular coexistence (ACC), minimizing the impact of interference from cellular networks
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
	IP access control lists (ACLs)
	Unified authentication on the cloud management platform
	Network address translation (NAT)
	Telemetry, quickly collecting AP status and application experience parameters
QoS features	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
	Airtime scheduling
	Air interface HQoS scheduling
Security features	Open system authentication
	WPA2-PSK authentication and encryption (WPA2-Personal)
	WPA2-802.1X authentication and encryption (WPA2-Enterprise)
	WPA3-SAE authentication and encryption (WPA3-Personal)
	WPA3-802.1X authentication and encryption (WPA3-Enterprise)
	WPA-WPA2 hybrid authentication
	WPA2-WPA3 hybrid authentication
	802.1X authentication, MAC address authentication, and Portal authentication
	DHCP snooping
Maintenance features	Unified management and maintenance on the cloud management platform
	Automatic AP onboarding and configuration loading, and plug-and-play (PnP)

Item	Description
	Batch upgrade
	STelnet using SSHv2
	SFTP using SSHv2
	Remote wireless O&M through the Bluetooth console port
	Real-time configuration monitoring and fast fault locating using the NMS
	System status alarm
	Network Time Protocol (NTP)

Technical Specifications

Item		Description
Technical specifications	Dimensions (diameter × height)	220 mm x 45 mm (8.66 in. x 1.77 in.)
	Port type	1 x 100M/1GE/2.5GE/5GE electrical port 1 x 10M/100M/1GE electrical port 1 x USB port **NOTE** • The 5GE electrical port supports PoE input.
	Bluetooth	BLE 5.2
	LED indicator	Indicates the power-on, startup, running, alarm, and fault states of the system.
Power specifications	Power input	• DC: 12 V ± 10% • PoE power supply: in compliance with 802.3at/af **NOTE** • When 802.3af power is supplied, the AP will operate with restrictions, for example the USB port is unavailable, and the details refer to the Info-Finder.
	Maximum power consumption	• 21.1 W (excluding USB) **NOTE** The actual maximum power consumption depends on local laws and regulations.
Environmental specifications	Operating temperature	–10°C to +50°C (14°F to 122°F)
	Storage temperature	–40°C to +70°C (–40°F to +158°F)
	Operating humidity	5% to 95% (non-condensing)
	Altitude	–60 m to +5000 m (–196.85 ft to +16404.20 ft)
	Atmospheric pressure	53 kPa to 106 kPa

Item		Description
Radio specifications	Antenna type	Built-in smart antennas
	Antenna gain	AirEngine 6576-57T： 2.4 GHz:4 dBi 5 GHz: 5 dBi 6 GHz: 5 dBi
	Maximum number of SSIDs for each radio	16
	Maximum number of users	1800 (600 per radio) **NOTE** The actual number of users varies according to the application environment.
	Maximum transmit power	2.4 GHz: 23 dBm (combined power) 5 GHz: 23 dBm (combined power) 6 GHz: 26 dBm (combined power) **NOTE** The actual transmit power depends on local laws and regulations.

Standards Compliance

Item	Description		
Safety standards	• UL 60950-1 • EN 60950-1 • IEC 60950-1	• UL 62368-1 • EN 62368-1 • IEC 62368-1	• GB 4943.1 • CAN/CSA 22.2 No.60950-1
Radio standards	• ETSI EN 300 328	• ETSI EN 301 893	• AS/NZS 4268
EMC standards	• EN 301 489-1 • EN 301 489-17 • EN 60601-1-1 • EN 60601-1-2 • EN 55024 • EN 55032 • EN 55035	• GB 9254 • GB 17625.1 • GB 17625.2 • AS/NZS CISPR32 • CISPR 24 • CISPR 32 • CISPR 35	• IEC/EN61000-4-2 • IEC/EN 61000-4-3 • IEC/EN 61000-4-4 • IEC/EN 61000-4-5 • IEC/EN61000-4-6 • ICES-003
IEEE standards	• IEEE 802.11a/b/g • IEEE 802.11n • IEEE 802.11ac • IEEE 802.11ax	• IEEE 802.11h • IEEE 802.11d • IEEE 802.11e • IEEE 802.11k	• IEEE 802.11v • IEEE 802.11w • IEEE 802.11r

Item	Description		
	• IEEE 802.11be		
Security standards	• 802.11i, Wi-Fi Protected Access (WPA), WPA2, WPA2-Enterprise, WPA2-PSK, WPA3 • 802.1X • Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP), WEP, Open • EAP Type(s)		
EMF	• EN 62311	• EN 50385	
RoHS	• Directive 2002/95/EC & 2011/65/EU • (EU)2015/863		
Reach	• Regulation 1907/2006/EC		
WEEE	• Directive 2002/96/EC & 2012/19/EU		

More Information

For more information about Huawei WLAN products, visit http://www.huawei.com or contact Huawei's local sales office.

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