Huawei AirEngine 5776-56T&AirEngine 5776-57T Access Points Datasheets

Product Overview

Huawei AirEngine 5776-56T &AirEngine 5776-57T are indoor access points (APs) in compliance with Wi-Fi 7 (802.11be). The Aps are empowered by brand-new Wi-Fi 7 technologies and 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 5776-56T &AirEngine 5776-57T ideal for densely populated scenarios such as mobile offices, schools, and stadiums.

AirEngine 5776-56T AirEngine 5776-57T

- AirEngine 5776-56T provides services simultaneously on both the 2.4 GHz (2x2), 5 GHz (2x2), and 5 GHz (2x2) frequency bands, at a rate of up to 689 Mbps at 2.4 GHz, 1.44 Gbps at 5 GHz, 2.88 Gbps at 5 GHz, and 5.01 Gbps for the device.
- AirEngine 5776-57T provides services simultaneously on the 2.4 GHz (2x2), 5 GHz (2x2), and 6 GHz (2x2) frequency bands, at a rate of up to 689 Mbps at 2.4 GHz, 1.44 Gbps at 5 GHz, 5.76 Gbps at 6 GHz, and 7.89 Gbps for the device.
- 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.
- Support Bluetooth serial port-based O&M through built-in Bluetooth and CloudCampus APP.
- Support Fit AP, Fat AP and cloud-managed AP modes, easily managing the AP and their services on Huawei cloud management platform and 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.

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 and provide low-latency access assurance. To achieve this goal, the Wi-Fi 7 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:

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 Wi-Fi 7 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.

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 Wi-Fi 7 standard defines multi-link aggregation technologies, including the MAC architecture of enhanced multi-link aggregation, multi-link channel access, and multi-link transmission.
- There are two modes as for MLO:
  - High-concurrency mode, multiple links send different data to improve bandwidth.
  - High-reliability mode, multiple links send the same data, improving reliability.

Leader AP

The leader AP integrates some WLAN AC functions and can be used to manage Fit APs in small- and medium-sized enterprises and stores, implementing WLAN AC-free access not requiring licenses and saving customer investment.

Wi-Fi 7 Application Scenarios

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

- Video streaming
- Video/Audio 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) Space time block code (STBC) Cyclic Delay Diversity (CDD)/Cyclic Shift Diversity (CSD) Beamforming Multi-user multiple-input multiple-output (MU-MIMO) Orthogonal frequency division multiple access (OFDMA) Preamble puncturing BSS Color TxBF TWT 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-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 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) 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) Spectrum analysis Terminal location
Network features	Compliance with IEEE 802.3ab Auto-negotiation of the rate and duplex mode, and automatic switchover between Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compatibility with IEEE 802.1Q SSID-based VLAN assignment Eth-Trunk function Management channel of the AP's uplink port in tagged and untagged modes DHCP client, obtaining IP addresses through DHCP Tunnel data forwarding and direct data forwarding STA isolation in the same VLAN IPv4/IPv6 access control list (ACL) Link Layer Discovery Protocol (LLDP) Service holding when CAPWAP link disconnection in direct data forwarding mode Unified authentication on the AC AC dual-link backup Telemetry, quickly collecting AP status and application experience parameters MESH HotSpot2.0 IPv6 SAVI
QoS features	WMM power save 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 Application identification and QoS classification to improve voice quality for popular applications, such as Zoom, QQ, and WeChat Airtime scheduling Air interface HQoS scheduling Intelligent multimedia scheduling

Item	Description
	VIP bandwidth reservation VIP FastPass, per-packet power control
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 WPA/WPA2/WPA2-PPSK authentication and encryption WPA/WPA2/WPA2-DPSK authentication and encryption WAPI authentication and encryption 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) WAPI GCM-SM4 encryption algorithm CAPWAP DTLS data encryption and decryption URL filtering MACsec@ Uplink Ethernet port Secure boot
EAP types	EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-CHAP, EAP-SIM, EAP-AKA, EAP-GTC, EAP-FAST, EAP-PEAP, EAP-MD5, EAP-MSCHAPv2, PEAPv0, PEAPv1
Maintenance features	Unified AP management and maintenance on the AC Automatic AP onboarding, automatic configuration loading, and plug-and-play (PnP) Automatic batch upgrade STelnet using SSHv2 SFTP using SSHv2 Remote wireless O&M through the Bluetooth serial port System status alarm

Fat 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)

Item	Description
	Space time block code (STBC) Cyclic Delay Diversity (CDD)/Cyclic Shift Diversity (CSD) Beamforming Multi-user multiple-input multiple-output (MU-MIMO) Orthogonal frequency division multiple access (OFDMA) Preamble puncturing BSS Color TxBF 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-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 Service set identifier (SSID) hiding configuration for each AP, supporting Chinese SSIDs Signal sustain technology (SST) Unscheduled automatic power save delivery (U-APSD) 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 Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compatibility with IEEE 802.1Q SSID-based VLAN assignment DHCP client, obtaining IP addresses through DHCP Tunnel data forwarding and direct data forwarding STA isolation in the same VLAN IPv4 access control list (ACL) Link Layer Discovery Protocol (LLDP) Leader AP Unified authentication of leader Aps

Item	Description
	NAT
QoS features	WMM power save Priority mapping for upstream packets and flow-based mapping for downstream packets Queue mapping and scheduling User-based bandwidth limiting Airtime scheduling Intelligent multimedia 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 MAC address authentication and Portal authentication DHCP snooping 802.11w Protected Management Frames (PMF) Secure boot
EAP types	EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-CHAP, EAP-SIM, EAP-AKA, EAP-GTC, EAP-FAST, EAP-PEAP, EAP-MD5, EAP-MSCHAPv2, PEAPv0, PEAPv1
Maintenance features	STelnet using SSHv2 SFTP using SSHv2 Remote wireless O&M through the Bluetooth serial port System status alarm

Cloud-Managed 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) Space time block code (STBC) Cyclic Delay Diversity (CDD)/Cyclic Shift Diversity (CSD) Beamforming Multi-user multiple-input multiple-output (MU-MIMO) Orthogonal frequency division multiple access (OFDMA) Preamble puncturing

Item	Description
	BSS Color TxBF TWT 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-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 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 Automatic AP Online by NCE (Campus) 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) Spectrum analysis Terminal location
Network features	Compliance with IEEE 802.3ab Auto-negotiation of the rate and duplex mode, and automatic switchover between Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compatibility with IEEE 802.1Q SSID-based VLAN assignment DHCP client, obtaining IP addresses through DHCP STA isolation in the same VLAN IPv4/IPv6 access control list (ACL) Link Layer Discovery Protocol (LLDP) Unified authentication on the cloud management platform Network address translation (NAT)

Item	Description
	Telemetry, quickly collecting AP status and application experience parameters MESH Tunnel-AC HotSpot2.0 IPv6 SAVI
QoS features	WMM power save 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 Application identification and QoS classification to improve voice quality for popular applications, such as Zoom, QQ, and WeChat Airtime scheduling Air interface HQoS scheduling Intelligent multimedia scheduling VIP bandwidth reservation VIP FastPass, per-packet power control
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 WPA/WPA2/WPA2-PPSK authentication and encryption WPA/WPA2/WPA2-DPSK authentication and encryption802.1X authentication, MAC address authentication, and Portal authentication 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 DHCP snooping 802.11w Protected Management Frames (PMF) CAPWAP DTLS data encryption and decryption URL filtering Secure boot
EAP types	EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-CHAP, EAP-SIM, EAP-AKA, EAP-GTC, EAP-FAST, EAP-PEAP, EAP-MD5, EAP-MSCHAPv2, PEAPv0, PEAPv1
Maintenance	Unified AP management and maintenance on the cloud management platform

Item	Description
features	Automatic AP onboarding, automatic configuration loading, and PnP Batch upgrade STelnet using SSHv2 SFTP using SSHv2 Remote wireless O&M through the Bluetooth serial port Real-time user configuration monitoring and fast fault locating using the NMS System status alarm Network Time Protocol (NTP)

Technical Specifications

Item		AirEngine 5776-56T	AirEngine 5776-57T
Technical specifications	Dimensions (Diameter × Height)	Φ220 mm x 45 mm	
	Weight	0.72 kg	0.75 kg
	Interface type	1 x 100M/1000M/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	Bluetooth 5.2	
	IoT	● Built-in multi-protocol IoT interfaces, flexibly supporting BLE, ZigBee, HomeKit, and Thread* ● USB port extension external IoT (Supports protocols such as ZigBee, RFID, and UWB) NOTE Features marked with asterisks (*) can be implemented through software upgrade.	
	LED indicator	Indicates the power-on, startup, running, alarm, and fault states of the system.	
Power specifications	Power input	● DC: 43.2 V to 57.6 V ● PoE power supply: in compliance with 802.3at/af	● DC: 12V±10% ● PoE power supply: in compliance with 802.3at/af NOTE ● 802.3af power supply restrictions are detailed in the Info-Finder.

Item		AirEngine 5776-56T	AirEngine 5776-57T
		NOTE 802.3at/af power supply restrictions are detailed in the Info-Finder.	
	Maximum power consumption	16.0 W (excluding USB)	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	
	Storage temperature	-40°C to +70°C	
	Operating humidity	5% to 95% (non-condensing)	
	Altitude	-60 m to +5000 m	
	Atmospheric pressure	53 kPa to 106 kPa	
Radio specifications	Antenna type	Built-in smart antennas	
	Antenna gain	• 2.4GHz: 4 dBi • 5GHz: 5 dBi • 5GHz: 5 dBi NOTE • The gains above are the single-antenna peak gains. • When all WLAN 2.4 GHz or 5 GHz antennas are combined, the equivalent antenna gain is 2 dBi for 2.4 GHz radios, 3 dBi for 5GHz-H radios, 3 dBi for 5 GHz-L radios.	• 2.4GHz: 4 dBi • 5GHz: 5 dBi • 6GHz: 5 dBi NOTE • The gains above are the single-antenna peak gains. • When all WLAN 2.4 GHz or 5 GHz antennas are combined, the equivalent antenna gain is 2 dBi for 2.4 GHz radios, 3 dBi for 5 GHz radios, 3 dBi for 6 GHz radios.
	Maximum number of SSIDs for each radio	16	
	Maximum number of users	1800 (600/Radios) NOTE The actual number of users varies according to the application environment.	
	Maximum transmit power	• 2.4 GHz: 23 dBm • 5 GHz: 23 dBm • 5 GHz: 23 dBm	• 2.4 GHz: 23 dBm • 5 GHz: 23 dBm • 6 GHz: 26 dBm

Item		AirEngine 5776-56T AirEngine 5776-57T
		NOTE Above are the combined power powers. The actual transmit power depends on local laws and regulations.
	Maximum transmit power	• 2.400 to 2.4835 GHz ISM • 5.150 to 5.250 GHz U-NII-1 • 5.250 to 5.350 GHz U-NII-2A • 5.470 to 5.725 GHz U-NII-2C • 5.725 to 5.850 GHz U-NII-3/ISM • 5.925 to 6.425 GHz U-NII-5 • 6.425 to 6.525 GHz U-NII-6 • 6.525 to 6.875 GHz U-NII-7 • 6.875 to 7.125 GHz U-NII-8 NOTE The available bands and channels are dependent on the configured regulatory domain (country). AirEngine 5776-56T doesn't support U-NII-5 to U-NII-8.

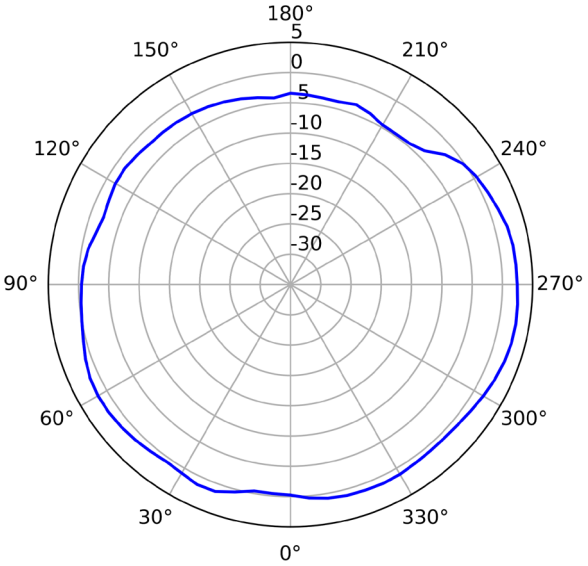
Standards Compliance

Item	Description		
Safety standards	• EN 62368-1	• IEC 62368-1	
Radio standards	• ETSI EN 300 328	• ETSI EN 301 893	• AN/NZS 4268
EMC standards	• EN 301 489-1 • EN 301 489-17 • EN 60601-1-2 • EN 55032 • EN 55035	• GB 9254 • GB 17625.2 • AS/NZS CISPR32 • CISPR 32 • CISPR 35	• IEC/EN61000-4-2 • IEC/EN 61000-4-3 • IEC/EN 61000-4-4 • IEC/EN 61000-4-5 • IEC/EN 61000-4-6 • ICES-003
IEEE standards	• IEEE 802.11a/b/g • IEEE 802.11n • IEEE 802.11ac • IEEE 802.11ax • IEEE 802.11be	• IEEE 802.11h • IEEE 802.11d • IEEE 802.11e • IEEE 802.11k	• IEEE 802.11v • IEEE 802.11w • IEEE 802.11r
Security standards	• 802.11i，Wi-Fi Protected Access (WPA)，WPA2，WPA2-Enterprise，WPA2-PSK，WPA3，WAPI • 802.1X • Advanced Encryption Standards(AES)，Temporal Key Integrity Protocol(TKIP)，WEP，Open • EAP Type(s)		
EMF	• EN 62311	• EN 50385	

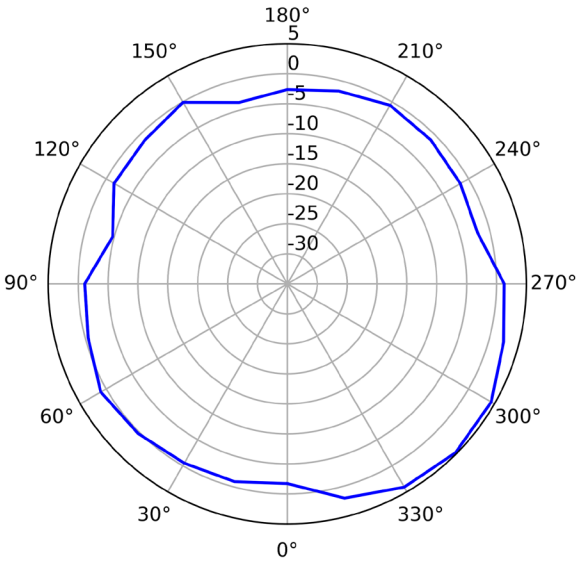
Item	Description
RoHS	• Directive 2002/95/EC & 2011/65/EU • (EU)2015/863
Reach	• Regulation 1907/2006/EC
WEEE	• Directive 2002/96/EC & 2012/19/EU

Antennas Pattern

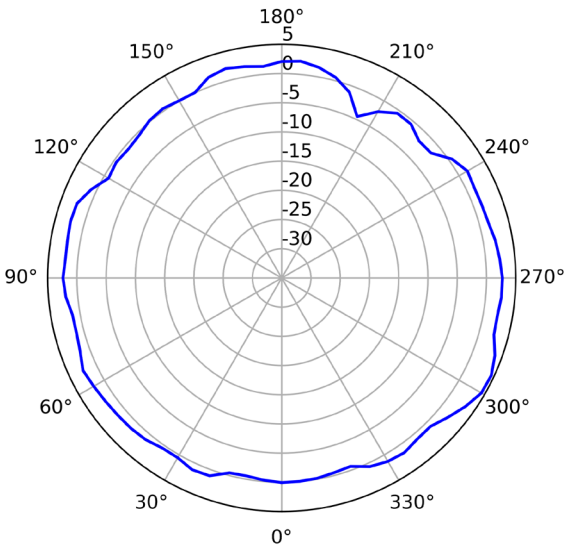
AirEngine 5776-56T



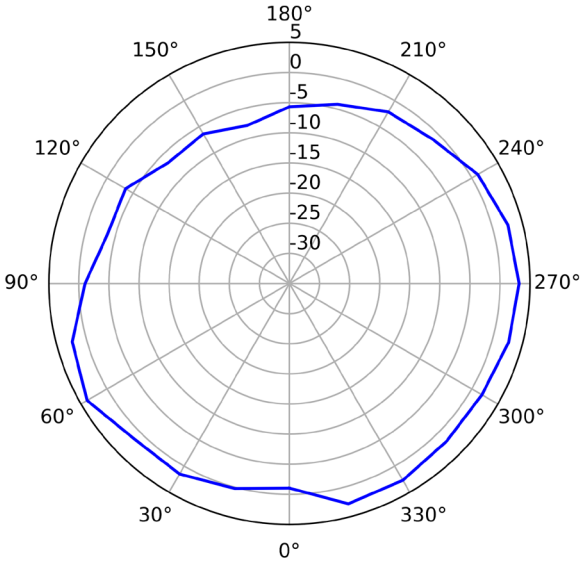
2.4GHz (Horizontal)



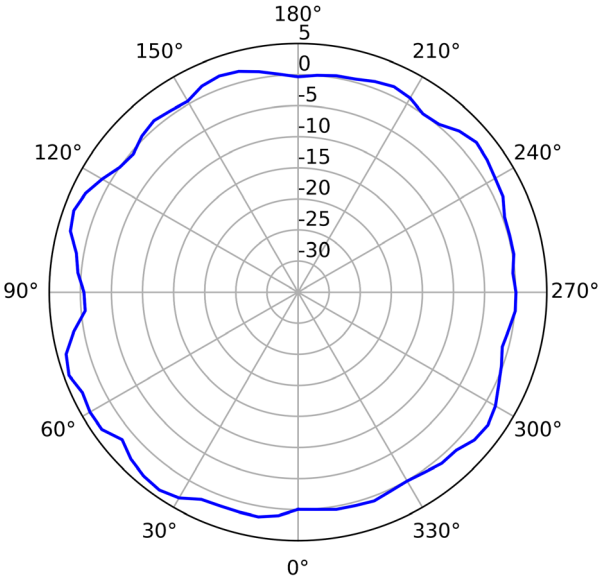
2.4GHz (Vertical)



5GHz (Horizontal)



5GHz (Vertical)



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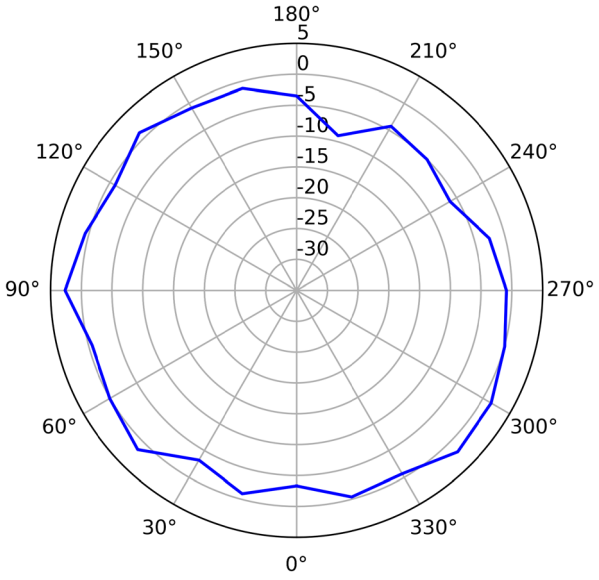
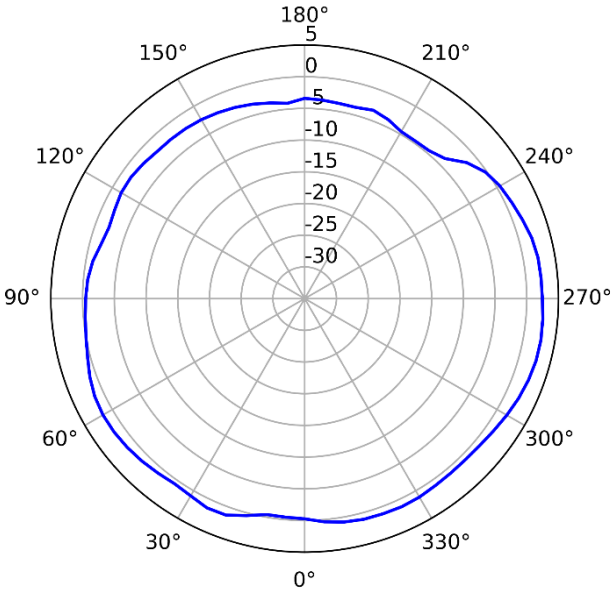
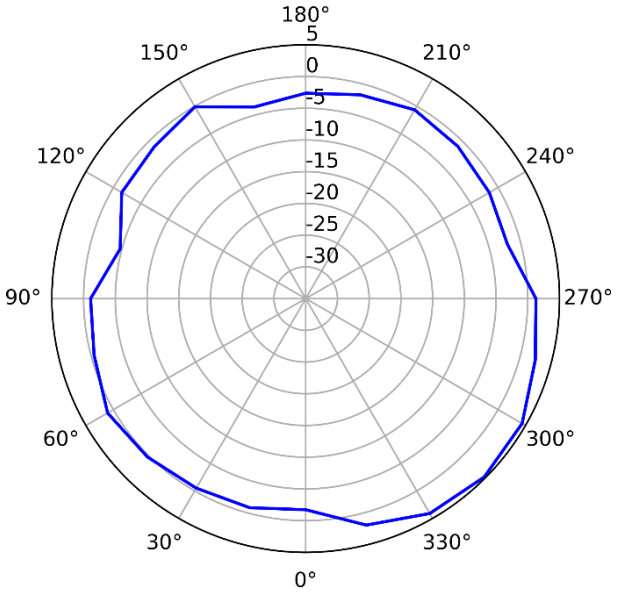


5GHz (Vertical)

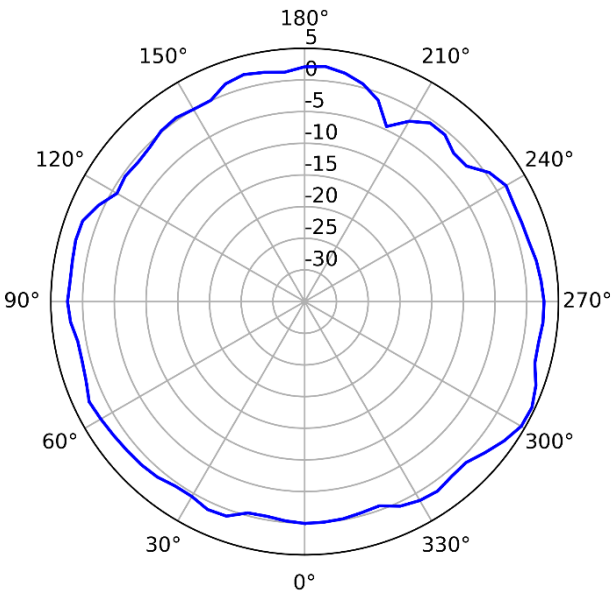
AirEngine 5776-57T



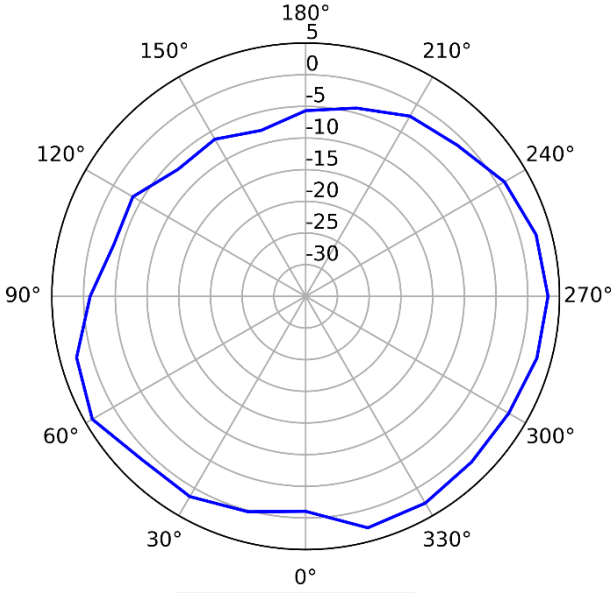
2.4GHz (Horizontal)



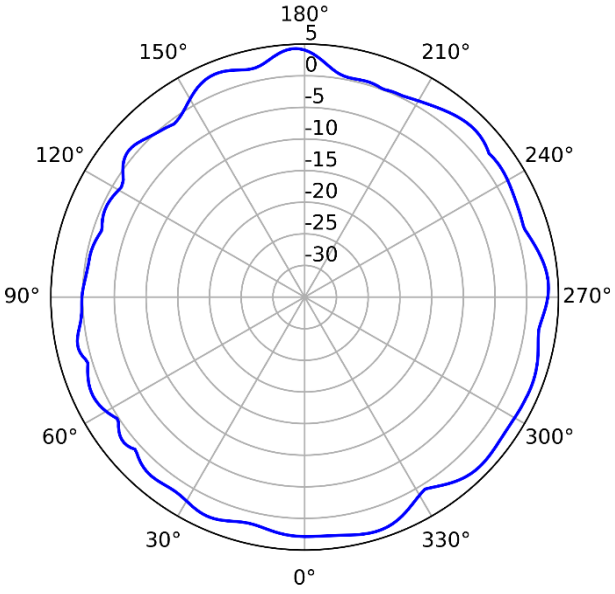
2.4GHz (Vertical)



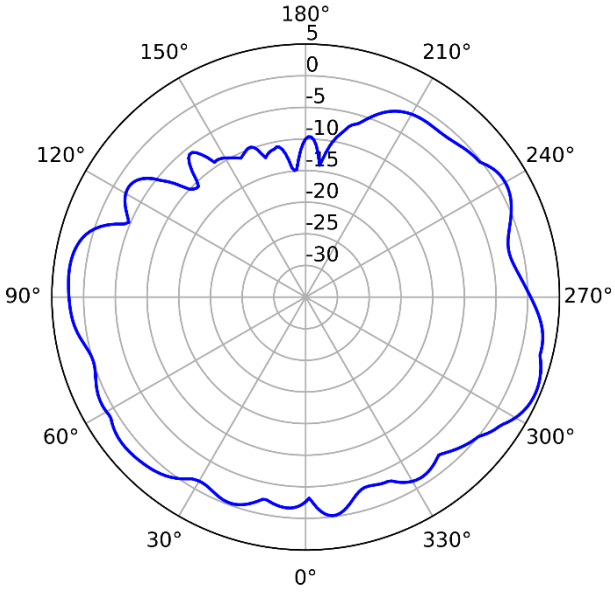
5GHz (Horizontal)



5GHz (Vertical)



6GHz (Horizontal)



6GHz (Vertical)

More Information

For more information about Huawei WLAN products, visit http://e.huawei.com/en/ or contact Huawei's local sales office. Alternatively, you can contact us through one of the following methods:

- Global service hotline: http://e.huawei.com/en/service-hotline
- Enterprise technical support website: http://support.huawei.com/enterprise/
- Service email address for enterprise users: support_e@huawei.com

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