Huawei AirEngine 6776-58TI Access Point Datasheet

Product Overview

Huawei AirEngine 6776-58TI is an indoor IoT access point (AP) in compliance with Wi-Fi 7 (802.11be). It can flexibly switch between 2.4 GHz (2x2 MIMO) + 5 GHz (4x4 MIMO) + 6 GHz (2x2 MIMO) mode and 2.4 GHz (4x4 MIMO) + 5 GHz (4x4 MIMO) mode. Designed with a total of 8 spatial streams, the AP delivers a data rate of up to 7.89 Gbps. AirEngine 6776-58TI has built-in smart antennas to enable always-on signals for users, and draws on Wi-Fi 7 innovations to redefine wireless user experience. These strengths make AirEngine 6776-58TI ideal for indoor coverage scenarios such as mobile office, education, healthcare, shopping malls/supermarkets and so on.



AirEngine 6776-58TI

- Provides services simultaneously on the 2.4 GHz (2x2 MIMO), 5 GHz (4x4 MIMO), and 6 GHz (2x2 MIMO) frequency bands, at a data rate of up to 689 Mbps at 2.4 GHz, 5.76 Gbps at 5 GHz, and 1.44 Gbps at 6 GHz, meaning 7.89 Gbps for the entire AP.
- 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.
- Built-in IoT slots (PCIe) and USB port for IoT expansion such as ZigBee and RFID
- Supports Bluetooth serial port-based O&M through built-in Bluetooth and CloudCampus APP.
- Supports Fit AP and cloud-managed AP modes, easily managing the AP and its services on Huawei cloud management platform and reducing network O&M costs.

NOTE

- The third radio (6 GHz) can be switched to the 2.4 GHz radio. In this case, the three radios become two radios: 2.4 GHz (4x4) +5 GHz (4x4). The data rate of the AP is up to 7.14 Gbps.
- The feature description and specification is based on the version of V600R24C10.

Feature Descriptions

Wi-Fi 7 (802.11be) standard

Wi-Fi 7 (802.11be) is the Wi-Fi standard, 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 (MRU), multi-link operation (MLO), enhanced multi-user multiple-input multiple-output (MU-MIMO). 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 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 can 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, 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.

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.

Wi-Fi Shield

Wi-Fi Shield is an innovative wireless security technology developed by Huawei. It transmits extra interference signals to ensure that only the target terminal can accurately receive data packets and signals, preventing malicious users from listening. The Wi-Fi shield function is supported. Eavesdropping terminals cannot capture packets over the air interface.

Wi-Fi CSI Sensing

Wi-Fi CSI sensing is a cutting-edge technology for implementing sensing by using channel state information (Channel State Information, CSI) generated during radio signal propagation. Based on the Wi-Fi 7 standard, Huawei innovatively introduces Wi-Fi CSI to sense the presence of personnel, so that Wi-Fi signals can be sensed wherever they are. Compared with cameras, it protects user privacy and applies to scenarios such as energy saving, health care, and smart security.

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.

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, 160 MHz and 320 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) 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

Item	Description
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 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

Item	Description
	802.1X authentication, MAC address authentication, and Portal authentication DHCP snooping 802.11w Protected Management Frames (PMF) CAPWAP DTLS data encryption and decryption URL filtering MACsec@ Uplink Ethernet port Wi-Fi Shield 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 Unified AP management on WebMaster
Sensing	Wi-Fi CSI Sensing

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) 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, 160 MHz and 320 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.

Item	Description
	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 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) WPA3-SAE authentication and encryption (WPA3-Personal) 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

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, 160 MHz and 320 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 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) Service holdover when the link to NCE-Campus is disconnected 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 IPv6 SAVI HotSpot2.0
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 encryption 802.1X 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 MACsec@ Uplink Ethernet port Wi-Fi Shield 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 cloud management platform Automatic AP onboarding, automatic configuration loading, and PnP Batch upgrade STelnet using SSHv2 SFTP using SSHv2

Item	Description
	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)
Sensing	Wi-Fi CSI Sensing

Technical Specifications

Item		Description
Technical specifications	Dimensions (H x W x D)	61 mm x 220 mm x 220 mm
	Weight	1.47 kg
	Port type	1 x 100M/1000M/2.5GE/5GE(RJ-45) 1 x 10M/100M/1000M (RJ-45) 1 x USB port **NOTE** The 5GE(RJ-45) and GE(RJ-45) support PoE input.
	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) • Built-in two IoT slots (PCIe), supporting IoT expansion such as ZigBee, RFID, and Thread* **NOTE** Features marked with asterisks (*) can be implemented through software upgrade.
	IoT expansion	Two built-in IoT slots (PCIe), supporting IoT expansion such as ZigBee, RFID, and Thread **NOTE** The Bluetooth function is unavailable when two serial port IoT cards are used at the same time.
	Bluetooth	BLE 5.4
	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 802.3bt/at (dual PoE inputs for hot backup) **NOTE** 802.3at/af power supply restrictions are detailed in the Info-Finder.
	Maximum power consumption	23.9 W (excluding USB and IoT cards) **NOTE** The actual maximum power consumption depends on local laws and regulations.

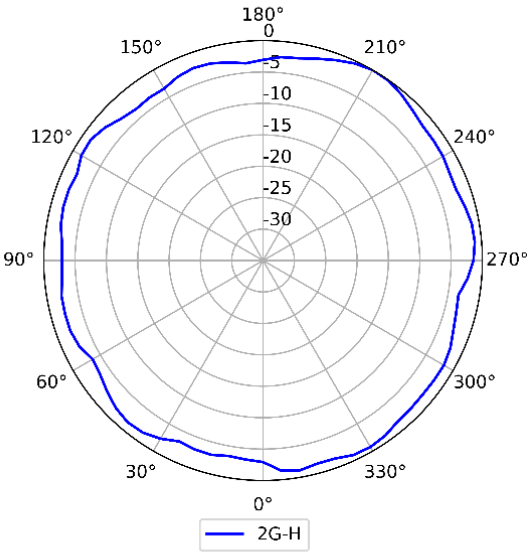
Item		Description
Environmental specifications	Operating temperature	-10°C to +50°C
	Storage temperature	-40°C to +70°C
	Operating humidity	5% to 95% (non-condensing)
	Altitude	-60 m to +5000 m
	Atmospheric pressure	53 kPa to 106 kPa
Radio specifications	Antenna type	Built-in smart antennas
	Antenna gain	2.4 GHz: 4 dBi 5 GHz: 5 dBi 6 GHz: 5 dBi **NOTE** The preceding gains are the peak gains of a single antenna. When all WLAN 2.4 GHz, 5 GHz, or 6 GHz antennas are combined, the equivalent antenna gain is 1 dBi for 2.4 GHz radios, 2 dBi for 5 GHz radios, or 2 dBi for 6 GHz radios.
	Maximum number of SSIDs for each radio	16
	Maximum transmit power	Mode 1 • 2.4 GHz (2x2): 23 dBm (combined power) • 5 GHz (4x4): 26 dBm (combined power) • 6 GHz (2x2): 23 dBm (combined power) Mode 2 • 2.4 GHz (4x4): 26 dBm (combined power) • 5 GHz (4x4): 26 dBm (combined power) **NOTE** The actual transmit power depends on local laws and regulations.
	Frequency bands	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).

Standards Compliance

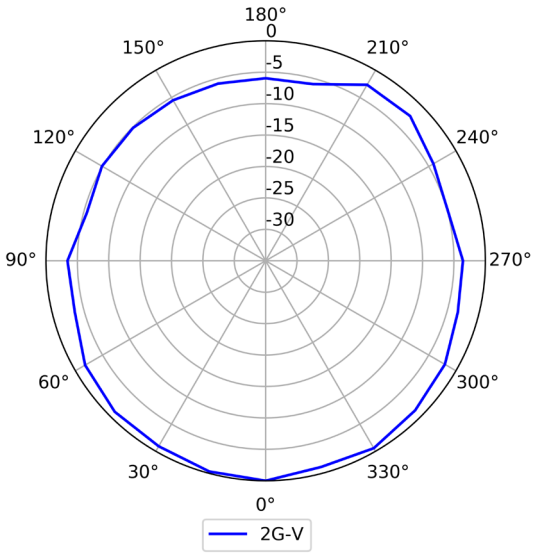
Item	Description

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

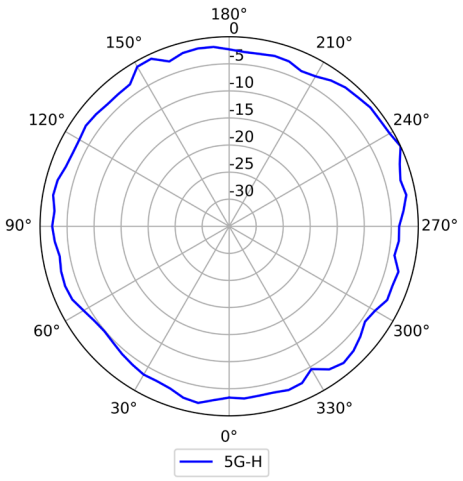
Antennas pattern



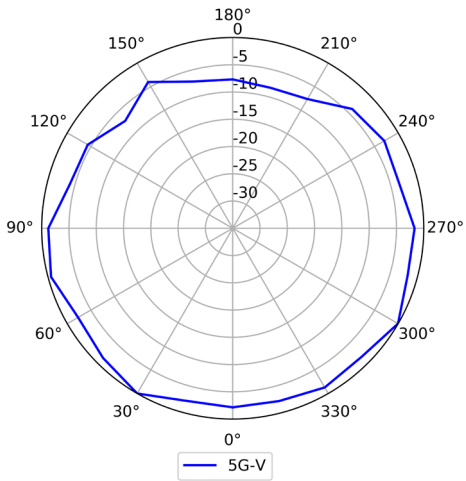
2.4GHz (Horizontal)



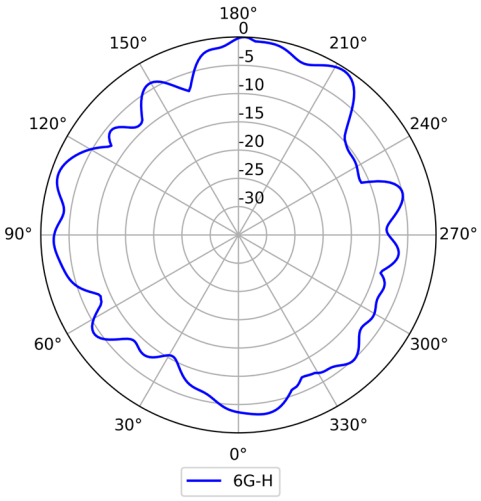
2.4GHz (Vertical)



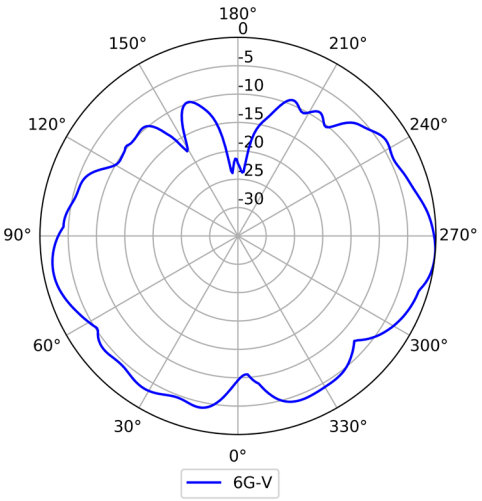
5GHz (Horizontal)



5GHz (Vertical)



6GHz (Horizontal)



6GHz (Vertical)

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