Extreme networks

Data Sheet

Highlights

High-Density Environments

- Delivers exceptional end-user experience even in dense user environments such as stadiums, large public venues, convention centers and school auditoriums
- Industry's first 802.11ax access point with three software programmable modes to optimally manage Enterprise networks, including a mode for dual 5 GHz radios for the most dense environments

Connects More Users and Devices Simultaneously

- Improve user experience and device performance with 4x4:4 5 GHz and 4x4:4 2.4 GHz, with OFDMA technology

Latest in Secure Wi-Fi

- Includes the latest WPA3* Wi-Fi security standard delivering robust protections for users and IoT devices

Optimizes RF for the Optimal User Experience

- Smart RF uses AI/ML technology to monitor and automatically adjust Wi-Fi radios to achieve the best coverage and greatest client performance, even in dynamic RF environments

Redundant PoE

- Mission critical networks for 24/7 operations

Cellular Coexistence Filter (CCF)

- Minimizes the impact of interference from cellular networks

Integrated Bluetooth for IoT and Guest Engagement

- Leverage the integrated Bluetooth to connection to IoT devices with Thread™ or engage loyalty customers with Apple iBeacon™. Enterprises can use Google Eddystone™ to send advertisements directly to fans or guests. This makes it ideal for venues/stadiums to advertise their app-download pages, captive portals, or site-specific information.

Smart Management Choices

- Extreme Campus Controller or VX/NX controller is ideal for on-premises requirements
- Extreme Campus Controller, /VX or NX controller plus additional cloud management capabilities provided via ExtremeCloud™ IQ

*Available in future software release.

ExtremeWireless™ AP560 Series for Very Highly Dense Outdoor Venues

Stadium Optimized Wi-Fi 6 Access Points

Product Overview

Extreme Networks is adding a new family of purpose-built 802.11ax (Wi-Fi 6) Access Points (APs) for Stadiums to its Smart portfolio, that support more users and IoT devices with greater performance and efficiency.

Key Benefits Include:

Stadium Optimized – As the Official Wi-Fi Solutions Provider of the NFL, Extreme understands first-hand the unique challenges stadiums present. The AP560 Series builds on that experience, by delivering a custom-designed family of access points that cater specifically to this environment. The unique, modular patent-pending design of our 802.11ax APs supports a high-density of users and devices, while delivering an exceptional user experience.

Flexible Deployment Options – Extreme's experience has taught us there is no one-size-fits-all solution for stadiums. From the field, to bowl seating, to gate entrances, to concierge areas, to parking lots, each area has its own requirements.

Modular Design – The AP560 series delivers flexible deployment options—from under-seat-mounted, to pole-mounted, to APs with software selectable antennas—they ensure an exceptional mobile experience throughout the entire stadium.

Future-Proofed – Extreme AP560 APs increase device capacity and improve spectral efficiency, allowing stadiums to extract more out of the Wi-Fi spectrum and future-proof their network and investment.

Powered by WiNG7

Extreme's AP560 Series is powered by the WiNG7 operating system. WiNG's legendary distributed architecture places the intelligence at the edge where it unleashes the true capabilities and performance of 802.11ax, without bottlenecks or limits. WiNG incorporates the functionality of a controller in each access point, enabling network solutions with controller-less solutions using a virtual controller that supports up to 64 access points or distributed solutions, comprised of branch sites with up to 256 access points per site. The solution can scale to 25,000 access points, and are managed with a simple cloud UI and workflow with ExtremeCloud or ExtremeCloud Appliance for campus and private cloud networks.

Extreme Software Configurable Radio

The industry's first 802.11ax access point, with three software programmable modes, optimally manages the dual 5GHz radios for the most dense environments. The AP560, powered by the WiNG7 operating system, allows for software configurable radios. Network managers can determine software network topology based on user environment, and configure the access points in different modes of operations:

- Mode 1 – Traditional dual radio 2.4 GHz and 5 GHz radio
- Mode 2 – 2.4 GHz/5 GHz sensor Radio 1 and 5 GHz on Radio 2
- Mode 3 – Dual 5 GHz radio

Managing the Complexity of RF

Network managers will appreciate a powerful choice of RF management for their 802.11 networks, with SmartRF. WiNG's SmartRF is a robust RF management system with AI/ML 'like' functionality. Built on 10 years of experience across thousands of large-scale networks and millions of access points, SmartRF's algorithms manage channels, radios, load balancing, band steering, and many other attributes of the RF.

ExtremeCloud and ExtremeCloud Appliance

Network managers have a choice of cloud or premise-based solutions, both using the same UI and workflows. ExtremeCloud is a hosted cloud service, while ExtremeCloud Appliance is designed for premise-based solutions of campus and private cloud. Both support secure zero-touch provisioning that significantly reduces deployment time connectivity via a single pane of glass for unified management of Extreme wired and wireless components in your network.

See the ExtremeCloud and ExtremeCloud Appliance data sheets for details and ordering part numbers.

802.11ax Technology

Whereas prior generations of 802.11n, 802.11ac Wave 1 and Wave 2, can be considered generational improvements, each building on the prior standard, the new PHY technology of 802.11ax adds a significant level of new technology which takes Wi-Fi networks to an entirely new level.

To learn more about 802.11ax, go to: https://www.extremenetworks.com/are-you-ready-for-802-11ax/.

Extreme AP560 Series At-A-Glance

AP560i–FCC **AP560i-WR**	**Access Point Only –** No mounting brackets (omnidirectional)	802.11ax High-Capacity Indoor/Outdoor AP with omnidirectional antenna	
AP560h–FCC **AP560h-WR**	**Access Point Only:** No mounting bracket (software selectable antennas).	802.11ax High-Capacity Indoor/Outdoor AP with software selectable antennas: 30 and 70 degree directional antennas.	

Specifications

Product Features	AP560i/AP560h
General	
Fully-Featured Enterprise Class AP	✓
Number of Wi-Fi Radios	2
Internet of Things (IoT) Radio	Dual mode selectable (2.4 GHz with coexistence) Bluetooth Low Energy (BLE) 4.1- Single and Dual mode operation (Classic and Low Power Profiles 802.15.4 -2011)
MIMO Implementation for High-Performance 11ax, 11ac, and 11n	4x4
Number of Spatial Streams	4 per radio
Product Features	**AP560i/AP560h**
Number of Simultaneous Streams	5 GHz radio: Four spatial stream Multi User (MU) MIMO for up to 4.8 Gbps wireless data rate to up to four 1 SS or two 2SS HE160 802.11ax DL-MU-MIMO capable client devices simultaneously (max)* Four spatial stream Multi User (MU) MIMO for up to 2.4 Gbps wireless data rate to up to four 1 SS or two 2SS HE80 802.11ax DL-MU-MIMO capable client devices simultaneously (typical)* 2.4 GHz radio: Four spatial stream Multi User (MU) MIMO for up to 1.148 Gbps wireless data rate to up to four 1 SS or two 2SS HE40 802.11ax DL-MU-MIMO capable client devices simultaneously (max)* Four spatial stream Multi User (MU) MIMO for up to 572 Mbps wireless data rate to up to four 1 SS or two 2SS HE20 802.11ax DL-MU-MIMO capable client devices simultaneously (typical)*
Maximum 2.4 GHz Radio	1.148 Gbps (40 MHz)
Maximum 5 GHz Radio	4.8 Gbps (Full 5 GHz 160 MHz)
Number of SSIDs Supported Per Radio/Total	8/16
Simultaneous Users Per Radio/Total	512/1024 Per AP
Mode of Operation	Semi-autonomous/Autonomous
Plug and Play Operation/Zero Touch Deployment	Yes
Security and Standards	WPA, WPA2 (AES), WPA3*, 802.11i, 802.1x, IPSec, IKEv2, PKCS #10, X509 DER/PKCS #12, SSL
Multiple Operating Modes	
Centralized Data Paths Within Same SSID	✓
Application Based Distributed and Centralized Data Paths Within Same User/Device Session	✓
Simultaneous RF Monitoring and Client Services	✓
BYOD/Device Fingerprinting Visibility	✓

Specifications (cont.)

Product Features	AP560i/AP560h
Application/Layer 7 Visibility and Control	✓
In-Channel WIDS	✓
In-Channel WIPS	✓
Dedicated Multi-Channel WIDS (Guardian Mode)	✓
Dedicated Multi-Channel WIPS (Guardian mode)	✓
Locates Devices and Threats via RF Triangulation	✓
Remote Access Point	✓
Hardware-Based, End-to-End Data and Control Plane Encryption	✓
Private and Public Cloud Deployments	✓
Policy Enforcement for Wireless Clients (L2-L7 Access Control, QoS, Rate Limiting, and VLAN Containment)	✓
Hybrid Operation	
Security Scanning and Serve Clients On Same Radio	✓
Multi-Channel Dedicated Security Scanning	✓
Adaptive Radio Management	
Dynamic Channel Control	802.11h: DFS and TPC support (ETSI)
Efficient Use of the Spectrum with A Multi-Channel Architecture	✓
Automatic Transmit Power and Channel Control	✓
Self-Healing with Coverage Gap Detection	✓
Band Steering with Multiple Steering Modes	✓
Per-Area Intelligent load balancing	✓
Airtime Fairness	✓
Performance Protection In Congested Rf Environments	✓
Fast Transition Roaming (802.11r)	✓
Mitigates Co-Channel Interference with Coordinated Access	✓
Mitigates Adjacent Channel Interference with Optimized Receive Sensitivity	✓
Efficient Reuse of Channels At Shorter Intervals	✓
Mitigates Non 802.11 Interference Without Dedicated Radios	✓
Probe Suppression and Client Link Monitoring	✓
Management Frame Protection (802.11w)	✓
Quality of Service	
Quality of Service (WMM, 802.11e)	✓
Power Save WMM-PS	✓
Fast BSS Transition, Voice-Enterprise (802.11r)	✓
Pre-Authentication (Pre-Auth)	✓
Opportunistic Key Caching (OKC)	✓
Bonjour/Llmnr/UPNP Identification, Containment and Control	✓
Supports Voice, Video, and Data Using the Same SSID	✓
Prioritizes Voice Over Data for Both Tagged and Untagged Traffic	✓
Rate Limiting (Rule and User-Based)	✓
Rule and Role Based QoS Processing	✓

***Note:** Available in future software release.

Specifications (cont.)

Multicast Rate Control	
Multicast to Unicast Conversion	✓
Adaptable Rate Multicast	✓
Power Save Mode Optimization for Multicast	✓
Wireless Service	
Media Access Protocol	CSMA/CA with ACK
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps 802.11n: (2.4 GHz); 6.5 to 600 (MCS0 to MCS15, HT20 to HT40) 802.11n: (5 GHz); 6.5 to 600 (MCS0 to MCS15, HT20 to HT40) 802.11ac: 6.5 to 3467 (MCS0 to MCS9, NSS=1 to 4, VHT20 to VHT160) 802.11ax: (2.4 GHz): 3.6 to 574 (MSC0 to MSC11, NSS = 1 to 2, HE20 to HE40) 802.11ax: (5 GHz): 3.6 to 4803 (MSC0 to MSC11, NSS = 1 to 4, HE20 to HE160) See 802.11n Receiver Sensitivity Table below See 802.11ac Receiver Sensitivity Table below See 802.11ax Receiver Sensitivity Table below
Frequency Bands	802.11ax/ac/a/n: 5.15 to 5.25 GHz (FCC) 5.25 to 5.35 GHz (FCC) 5.47 to 5.725 GHz (FCC) 5.725 to 5.850 GHz (FCC) 802.11b/g/n: 2.400 to 2.4835 GHz (FCC)
Product Features	**AP560i/AP560h**
Wireless Modulation	802.11ax: OFDMA (1024-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64QAM, 256-QAM) 802.11ac Packet Aggregation: A-MPDU, A-MSDU 802.11ac Very High-Throughput (VHT): VHT20/40/80 802.11ac Advanced Features: LDPC, STBC, Maximum Likelihood (ML) Detection 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n High-throughput (HT) support: HT 20/40 802.11n Packet aggregation: A-MPDU, A-MSDU 802.11n Advanced Features: LDPC, STBC and TxBF 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11g: DSSS and OFDM 802.11b: DSSS

Max Antenna Gain (AP560i)			
Software Mode	**Radio 1**	**Radio 2**	**IoT Radio**
Mode 1	2.4 GHz 4 dBi	5 GHz 5 dB	5 dBi
Mode 2	2.4 GHz 4 dBi 5 GHz 6 dBi	5 GHz 6 dBi	5 dBi
Mode 3	5 GHz 5 dBi	5 GHz 6 dBi	5 dBi

Max Antenna Gain (AP560h 30deg)			
Software Mode	**Radio 1**	**Radio 2**	**IoT Radio**
Mode 1	2.4GHz 8 dBi	5GHz 8 dBi	3 dBi
Mode 2	2.4GHz 8 dBi 5GHz 8 dBi	5GHz 8 dBi	3 dBi
Mode 3	5GHz 8 dBi	5GHz 8 dBi	3 dBi

Specifications (cont.)

Max Antenna Gain (AP560h 70deg)			
Software Mode	**Radio 1**	**Radio 2**	**IoT Radio**
Mode 1	2.4GHz 6 dBi	5GHz 6 dBi	3 dBi
Mode 2	2.4GHz 6 dBi 5GHz 6 dBi	5GHz 6 dBi	3 dBi
Mode 3	5GHz 6 dBi	5GHz 6 dBi	3 dBi

Physical Characteristics	
Dimensions	AP560i – 11.3″ x 10″ x 2.9″ (288 mm x 254 mm x 75 mm) AP560h – 11.3″ x 18.9″ x 3.5″ (288 mm x 481 mm x 88 mm)
Housing	AP560i – 8.99 lbs – 4.08 kg AP560h – 10.5 lbs – 4.77 kg
IP Rating	IP67
LAN Ethernet	1 x 100/1000/2500/5000 Mbps auto-negotiation Ethernet port, RJ45 1 x 10/100/1000 Mpbs auto-negotiation Ethernet port , RJ45
Console port	RJ45
USB Port	USB 3.0 port, Type A for purpose built modules
PoE Failover	Redundant PoE Capable
LEDs Activity Indication	Two top mounted LEDs – multiple LED radio Indicators
Physical Characteristics (cont.)	
Energy Efficient	802.3az Energy-Efficient Ethernet
Anti-Theft Locks	Kensington Lock Security Hanger Lock
Warranty	1 Year Warranty (WiNG)
MTBF	319,436 Hours AP560i, 313,544 Hours AP560h

Note: Actual available power would vary based on local regulatory requirement and actual channels used for operation.

Environmental	
Operating Temperature -AP560i	Temperature -40° C to +55° C (-40° F to + 131 F)
Operating Temperature -AP560h	Temperature -40° C to +55° C (-40° F to + 131 F)
Humidity	0 – 95% (noncondensing)
Storage and Transportation	Temperature -40° C to +70° C (-40° F to + 158° F)
Electrostatic Discharge	15kV air, 8kV contact
Max PSI Rating	3,000 PSI from 1 in

Power Specifications	
Operating Voltage	PoE-PD: 48-57VDC
Operating Current	PoE-PD: 500mA at 48V
PoE PD Class	802.3at
Power consumption	Max: 22 W (specify mode without USB) Idle (radios ON) : 9.5 W Typical 18 W; Max 22 W
Warranty	1 Year Warranty (WiNG)

Specifications (cont.)

Wireless and EMC	
Compliance	FCC CFR 47 Part 15, Class B ICES-003 Class B FCC Subpart C 15.247 FCC Subpart E 15.407
Safety	EN 60950-1, 62368-1 UL 60950-1, 62368-1 CAS 22.2 No. 60950-1-03, 62368-1 AS/NZS 60950.1, 62368-1

Wi-Fi Alliance Certifications	
Connectivity	Wi-Fi CERTIFIED 6™ Wi-Fi CERTIFIED™ a, b, g, n, ac WPA™ – Enterprise, Personal WPA2™ – Enterprise, Personal WPA3™ – Enterprise, Personal
Optimization	Wi-Fi Agile Multiband™ Wi-Fi Vantage™ WMM® WMM®-Admission Control WMM®-Power Save
Access	Passpoint®
Applications and Services	Voice-Enterprise

Ordering Information

Part Number	Description
Access Points	
AP560i-FCC	Cloud-ready, Dual 5GHz, Dual band, Sensor radio, Dual Radio 802.11ax/ac/abgn, 4x4:4 MIMO Outdoor 11ax access point. Internal Antenna Domain: US and Columbia
AP560h-FCC	Cloud-ready, Dual 5GHz, Dual band, Sensor radio, Dual Radio 802.11ax/ac/abgn, 4x4:4 MIMO Outdoor 11ax access point. Internal 30deg/70deg Panel Antenna Domain: US and Columbia
AP560i-WR	Cloud-ready, Dual 5GHz, Dual band, Sensor radio, Dual Radio 802.11ax/ac/abgn, 4x4:4 MIMO Outdoor 11ax access point. Internal Antenna Domain: Canada, EMEA and Singapore
AP560h-WR	Cloud-ready, Dual 5GHz, Dual band, Sensor radio, Dual Radio 802.11ax/ac/abgn, 4x4:4 MIMO Outdoor 11ax access point. Internal 30deg/70deg Panel Antenna Domain: Canada, EMEA and Singapore
Accessories	
30524	WS-EIO-02 Silicone Rubber Chamfer Gasket Kit for WS-EIO-01 or EIO-04 AP Enclosure
EIO-04	Underseat Mounting Solution for AP560i
KT-147407-02	OUTDOOR MOUNTING HARDWARE KIT FOR OUTDOOR ACCESS POINTS- STAINLESS STEEL FOR HARSH ENVIRONMENTS
KT-150173-01	OUTDOOR AP 12 IN EXT ARM FOR MNTG KIT
30520	WS-MBO-POLE01 Outdoor Pole mounting bracket for AP3917i/e or AP7662 i/e
MBO-ART02	MBO-ART02 Articulating Mtg Brkt
Mid-Span PoE Devices	
PD-9001GO-ENT	OUTDOOR 802.3AT POE SINGLE PORT MIDSPAN

Note: Actual available power would vary based on local regulatory requirement and actual channels used for operation.

Warranty

As a customer-centric company, Extreme Networks is committed to providing quality products and solutions. In the event that one of our products fails due to a defect, we have developed a comprehensive warranty that protects you and provides a simple way to get your products repaired or media replaced as soon as possible.

Service and Support

Extreme Networks provides comprehensive service offerings that range from Professional Services to design,deploy and optimization of customer networks, customized technical training, to service and support tailored to individual customer needs. Please contact your Extreme Networks account executive for more information about Extreme Networks Service and Support.

For full warranty terms and conditions please go to: https://extremeportal.force.com/.

IoT Radio Sensitivity

Typical Receiver Sensitivity	dBm
BlueTooth Low Energy	-90
802.15.4	-100

Radio RF Performance

2.4 GHz

	Maximum Transmit Power (dBm) per Transmit Chain	Receiver Sensitivity (dBm) per Receiver Chain
	For mode 1 and 2. For Dual 5G (mode 3) target power reduces by 2dB.	For mode 1 and 2. For Dual 5G (mode 3) sensitivity reduces by 2dB.
	AP560i/AP560h	AP 560i/AP560h
802.11b		
1 Mbps	18	-97
11 Mbps	18	-89
802.11g		
6 Mbps	18	-95
54 Mbps	16	-76
802.11n HT20		
MCS 0	18	-93
MCS 7	16	75
802.11ax HE20		
MCS 0	18	-93
MCS 11	14	-63

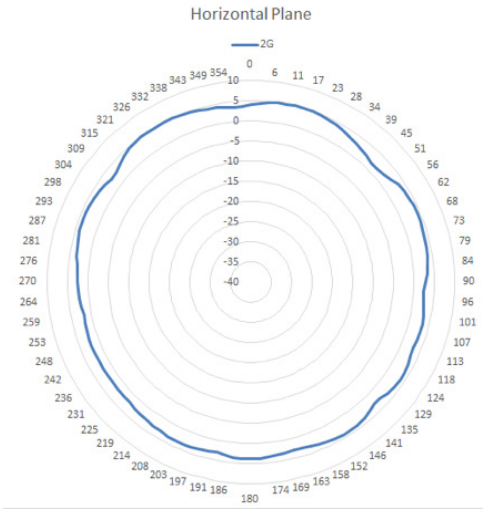
Radio RF Performance

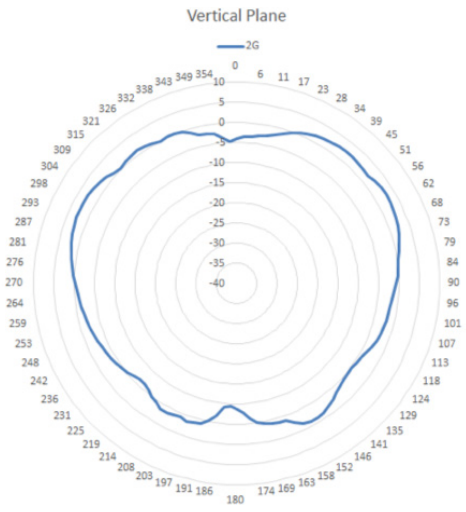
5 GHz

	Maximum Transmit Power (dBm) per Transmit Chain	Receiver Sensitivity (dBm) per Receiver Chain
	For mode 1 and 2. For Dual 5G (mode 3) target power reduces by 2dB.	For mode 1 and 2. For Dual 5G (mode 3) sensitivity reduces by 2dB.
	AP560i/AP560h	AP 560i/AP560h
802.11a		
6 Mbps	18	-91
54 Mbps	17	-74
802.11n HT20		
MCS 0	18	-91
MCS 7	16	-72
MCS 0	18	-89
MCS 7	16	-69
802.11ac VHT20		
MCS 0	18	-91
MCS 8	15	-68
802.11ac VHT40		
MCS 0	18	-89
MCS 9	15	-63
802.11ac VHT80		
MCS 0	18	-86
MCS 9	15	-60
5 GHz, 802.11ac VHT160		
MCS 0	18	-81
MCS 9	15	-57
5 GHz, 802.11ax HE20		
MCS 0	18	-90
MCS 11	14	-60

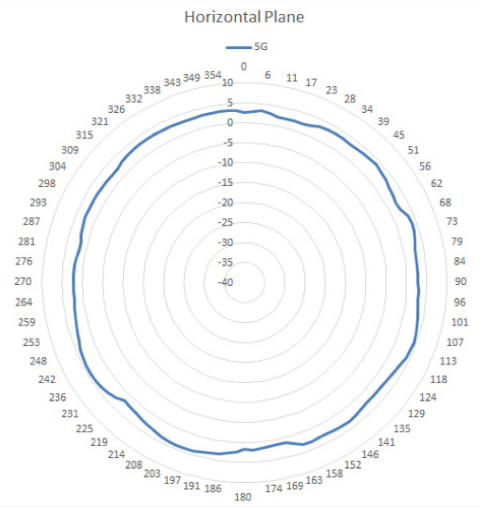
AP560i Antenna Radiation Patterns

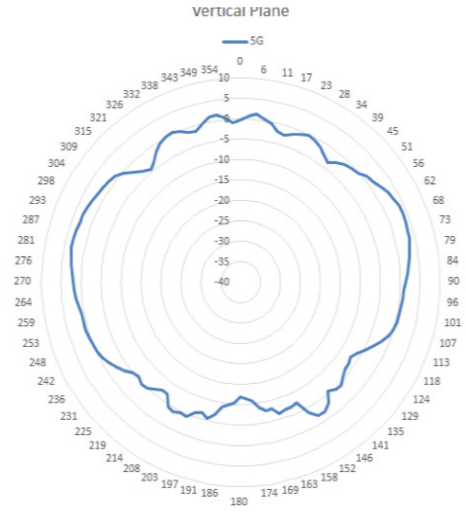
Radio 1 – 2.4 GHz



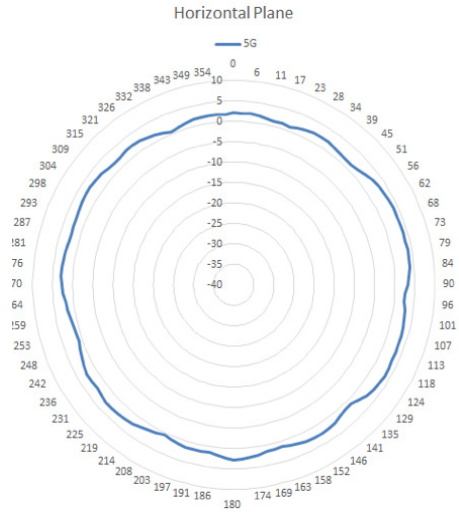


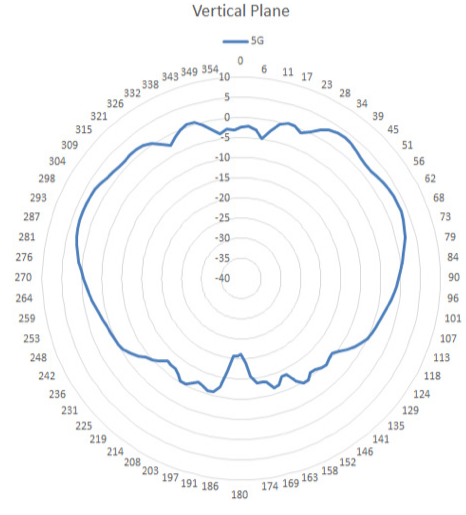
Radio 2 – 5 GHz





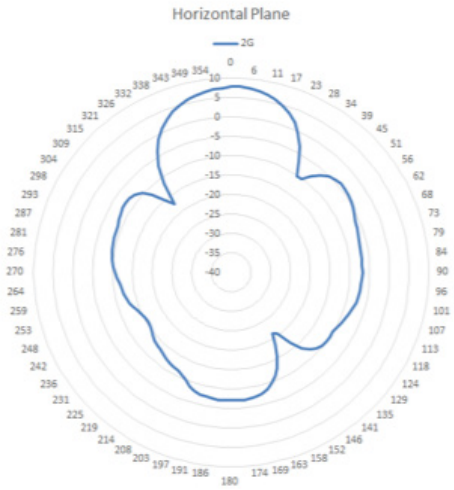
Radio 1 – 5 GHz

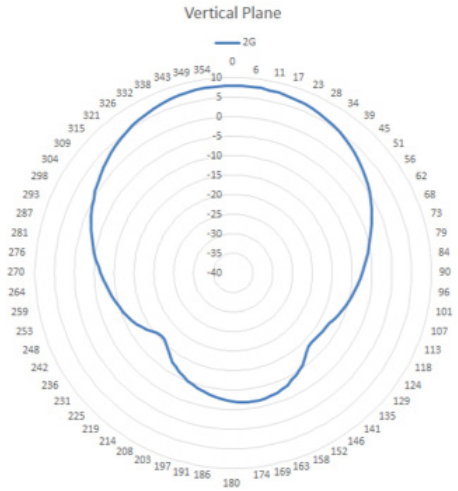




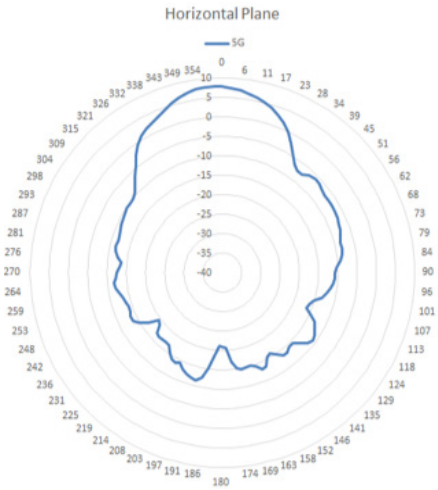
AP560h Antenna Radiation Patterns

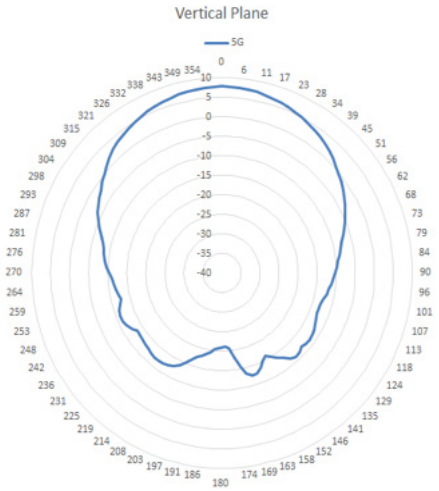
Radio 1 –2.4 GHz (30 degrees)



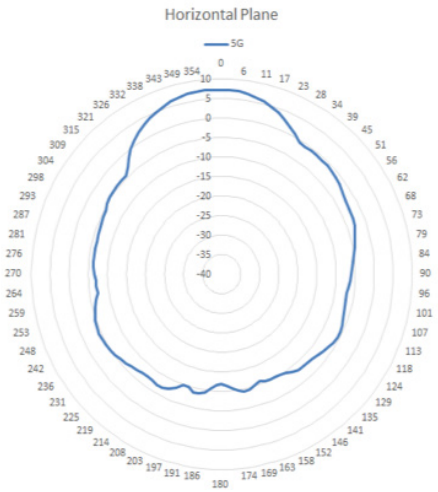


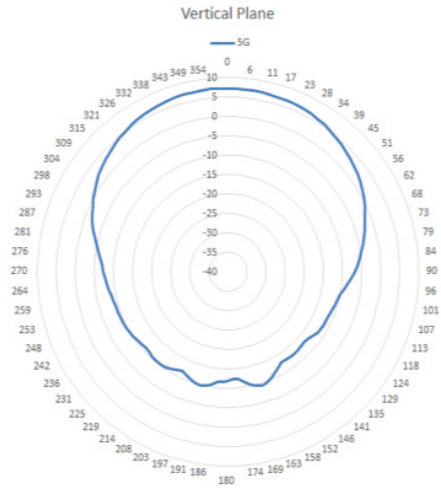
Radio 2 – 5 GHz (30 degrees)





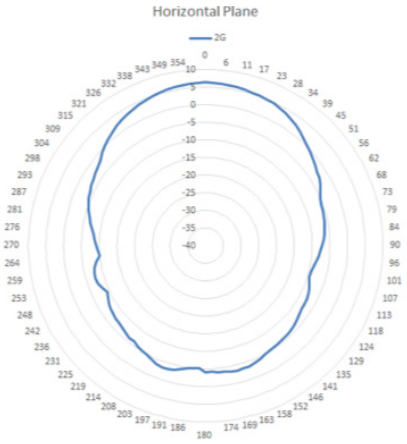
Radio 1 – 5 GHz (30 degrees)

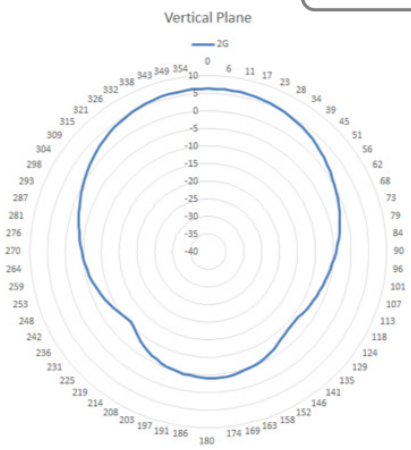




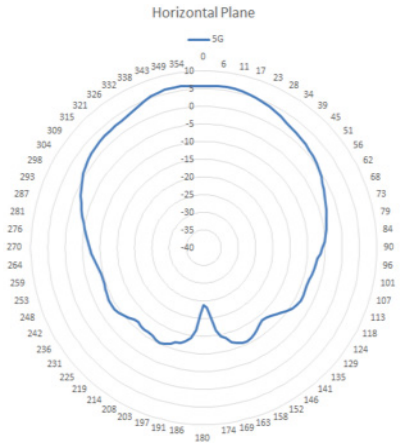
AP560h Antenna Radiation Patterns

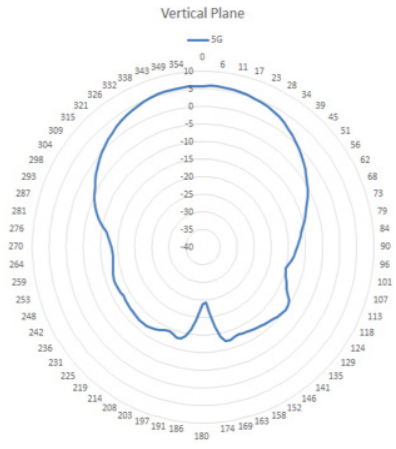
Radio 1 - 2.4 GHz (70 degree)



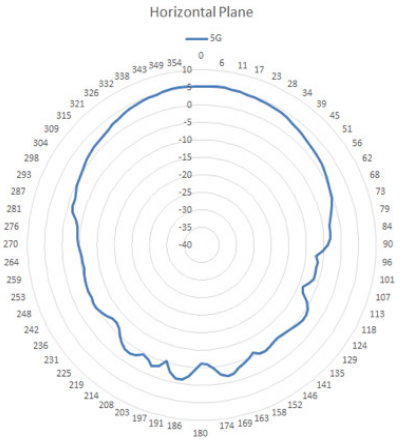


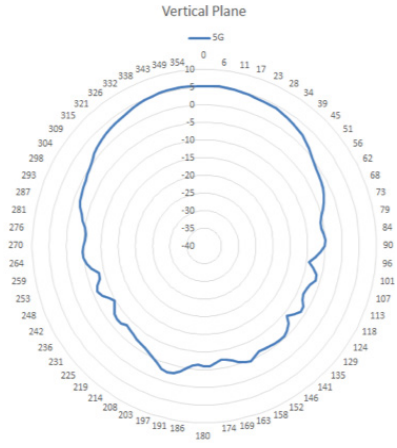
Radio 2 – 5 GHz (70 degrees)





Radio 1 – 5 GHz (70 degrees)





Extreme networks

http://www.extremenetworks.com/contact