

## DATA SHEET

# ARUBA 500 SERIES CAMPUS ACCESS POINTS

Cost-effective Wi-Fi 6 (802.11ax) for medium-density indoor environments

These affordable Wi-Fi 6 access points provide high-performance connectivity for any organization experiencing growing numbers of mobile, IoT and mobility requirements. With a combined peak data rate of up to 1.49Gbps, they deliver the speed and reliability needed for venues and workplaces such as schools, midsize offices and retailers.

## INCREDIBLE EFFICIENCY

The 500 Series APs are also designed to optimize user experience by maximizing Wi-Fi efficiency and dramatically reducing airtime contention between clients.

Features include Orthogonal frequency-division multiple access (OFDMA), and cellular optimization. With up to 2 spatial streams (2SS) and 80MHz channel bandwidth (HE80), the 500 Series provides groundbreaking wireless capabilities for budget-conscious deployments.

Read the Multi-User 802.11ax [white paper](#) for further information.

## Advantages of OFDMA

This capability allows Aruba's APs to handle multiple Wi-Fi 6 capable clients on each channel simultaneously, regardless of device or traffic type. Channel utilization is optimized by handling each transaction via smaller sub-carriers or resource units (RUs), which means that clients are sharing a channel and not competing for airtime and bandwidth.

## WI-FI OPTIMIZATION

### Client optimization

Aruba's patented AI-powered ClientMatch technology eliminates sticky client issues by steering a client to the AP where it receives the best radio signal. Client Match steers traffic from the noisy 2.4 GHz band to the preferred 5 GHz or 6 GHz band depending on client capabilities. ClientMatch also dynamically steers traffic to load balance APs to improve the user experience.



## KEY FEATURES

- Up to 1.49Gbps combined peak data rate
- WPA3 and Enhanced Open security
- Built-in technology that resolves sticky client issues for Wi-Fi 6 and Wi-Fi 5 devices
- OFDMA for enhanced multi-user efficiency
- IoT-ready Bluetooth 5 and Zigbee support
- Embedded ranging technology for accurate indoor location measurements

## Automated Wi-Fi radio frequency management

To optimize the user experience and provide greater stability, Aruba AirMatch allows organization to automate network optimization using machine learning. AirMatch provides dynamic bandwidth adjustments to support changing device density, enhanced roaming using an even distribution of Effective Isotropic Radiated Power (EIRP) to radios, and real-time channel assignments to mitigate co-channel interference.

## Application Assurance

With Air Slice, organizations can provide application assurance to their users that goes beyond the traditional capabilities of airtime fairness. After the SLAs are configured, Air Slice monitors network usage, automatically allocates radio resources, and dynamically adjusts radio resources as



new users connect. and applications sessions begin or end.

### **Aruba Advanced Cellular Coexistence (ACC)**

This feature uses built-in filtering to automatically minimize the impact of interference from cellular networks, distributed antenna systems (DAS), and commercial small cell or femtocell equipment.

### **Intelligent Power Monitoring (IPM)**

Aruba APs continuously monitor and report hardware energy consumption. They can also be configured to enable or disable capabilities based on available PoE power – ideal when wired switches have exhausted their power budget.

### **IOT PLATFORM CAPABILITIES**

The 500 Series includes an integrated Bluetooth 5 and 802.15.4 radio (for Zigbee support) to simplify deploying and managing IoT-based location services, asset tracking services, security solutions and IoT sensors. This allows organizations to leverage the 500 Series as an IoT platform, which eliminates the need for an overlay infrastructure and additional IT resources.

### **Target Wake Time (TWT)**

Ideal for IoTs that communicate infrequently, TWT establishes a schedule for when clients need to communicate with an AP. This helps improve client power savings and reduces airtime contention with other clients.

### **FOUNDATION FOR ACCURATE INDOOR LOCATION**

Aruba APs act as a foundation for accurate indoor location so that location-aware services can be deployed at scale. Using embedded GPS receivers, Aruba Wi-Fi 6E APs are able to self-locate and work with Wi-Fi 6 APs to establish reference points that can be used to accurately determine indoor client location.

Because they use universal latitude and longitude coordinates, there is no need for custom map development or to create separate applications for indoor and outdoor environments.

### **ARUBA SECURE INFRASTRUCTURE**

The Aruba 500 Series includes components of Aruba's 360 Secure Fabric to help protect user authentication and wireless traffic. Select capabilities include:

#### **WPA3 and Enhanced Open**

Support for stronger encryption and authentication is provided via the latest version of WPA for enterprise protected networks.

Enhanced Open offers seamless new protection for users connecting to open networks where each session is automatically encrypted to protect user passwords and data on guest networks.

#### **WPA2-MPSK**

MPSK enables simpler passkey management for WPA2 devices – should the Wi-Fi password on one device or device type change, no additional changes are needed for other devices. Requires ClearPass Policy Manager.

#### **VPN Tunnels**

In Remote AP (RAP) and IAP-VPN deployments, the Aruba 500 Series can be used to establish a secure SSL/IPSec VPN tunnel to a Mobility Controller that is acting as a VPN concentrator.

#### **Trusted Platform Module (TPM)**

For enhanced device assurance, all Aruba APs have an installed TPM for secure storage of credentials and keys, and boot code.

### **SIMPLE AND SECURE ACCESS**

To simplify policy enforcement, the Aruba 500 Series uses Aruba's policy enforcement firewall (PEF) feature to encapsulate all traffic from the AP to the Mobility Controller (or Gateway) for end-to-end encryption and inspection. Policies are applied based on user role, device type, applications, and location. This reduces the manual configuration of SSIDs, VLANs and ACLs. PEF also serves as the underlying technology for Aruba **Dynamic Segmentation**.



### HIGH-DENSITY CONNECTIVITY

Each 500 Series AP provides connectivity for a maximum of 256 associated clients per radio (512 in total). In real-world scenarios, the maximum recommended client density is dependent on environmental conditions.

### FLEXIBLE OPERATION AND MANAGEMENT

Our unified APs can operate as standalone access points or with a gateway for greater scalability, security, and manageability. APs can be deployed using zero touch provisioning – without on-site technical expertise – for ease of implementation in branch offices and for remote work.

Aruba APs can be managed using cloud-based or on-premises solutions for any campus, branch, or remote work environment. As the management and orchestration console for Aruba ESP (Edge Services Platform), Aruba Central provides a single pane of glass for overseeing every aspect of wired and wireless LANs, WANs, and VPNs. AI-powered analytics, end-to-end orchestration and automation, and advanced security features are built natively into the solution.

### ADDITIONAL WI-FI FEATURES

Each AP also includes the following standards-based technologies:

<b>Transmit beamforming (TxBF)</b>	Increased signal reliability and range
<b>Passpoint Wi-Fi (Release 2) (Hotspot 2.0)</b>	Seamless cellular-to-Wi-Fi carryover for guests
<b>Dynamic Frequency Selection (DFS)</b>	Optimized use of available RF spectrum
<b>Maximum Ratio Combining (MRC)</b>	Improved receiver performance
<b>Cyclic Delay/Shift Diversity (CDD/CSD)</b>	Greater downlink RF performance
<b>Space-Time Block Coding</b>	Increased range and improved reception
<b>Low-Density Parity Check (LDPC)</b>	High-efficiency error correction for increased throughput



TECHNICAL SPECIFICATIONS		
Model	AP-504	AP-505 and AP-505S
AP type	Indoor, dual radio, 5GHz and 2.4GHz 802.11ax 2x2 MIMO	
5GHz radio	Two spatial stream Single User (SU) MIMO for up to 1.2Gbps wireless data rate with 2SS HE80 802.11ax client devices	
2.4GHz radio	Two spatial stream Single User (SU) MIMO for up to 574Mbps (287 Mbps) wireless data rate with 2SS HE40 (HE20) 802.11ax client devices	
Maximum number of associated client devices	Up to 256 associated client devices per radio	
Maximum number of BSSIDs	16 BSSIDs per radio	
Supported frequency bands (country-specific restrictions apply)	<ul style="list-style-type: none"> <li>• 2.400 to 2.4835GHz ISM</li> <li>• 5.150 to 5.250GHz U-NII-1</li> <li>• 5.250 to 5.350GHz U-NII-2A</li> <li>• 5.470 to 5.725GHz U-NII-2C</li> <li>• 5.725 to 5.850GHz U-NII-3/ISM</li> </ul>	
Available channels	Dependent on configured regulatory domain	
Supported radio technologies	<ul style="list-style-type: none"> <li>• 802.11b: Direct-sequence spread-spectrum (DSSS)</li> <li>• 802.11a/g/n/ac: Orthogonal frequency-division multiplexing (OFDM)</li> <li>• 802.11ax: Orthogonal frequency-division multiple access (OFDMA) with up to 8 resource units</li> </ul>	
Supported modulation types:	<ul style="list-style-type: none"> <li>• 802.11b: BPSK, QPSK, CCK</li> <li>• 802.11a/g/n: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM (proprietary extension)</li> <li>• 802.11ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM (proprietary extension)</li> <li>• 802.11ax: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM</li> </ul>	
802.11n high-throughput (HT) support:	HT20/40	
802.11ac very high throughput (VHT) support:	VHT20/40/80	
802.11ax high efficiency (HE) support:	HE20/40/80	
Supported data rates (Mbps):	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 11</li> <li>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54</li> <li>• 802.11n: 6.5 to 300 (MCS0 to MCS15, HT20 to HT40), 400 with 256-QAM</li> <li>• 802.11ac: 6.5 to 867 (MCS0 to MCS9, NSS = 1 to 2, VHT20 to VHT80), 1,083 with 1024-QAM</li> <li>• 802.11ax (2.4GHz): 3.6 to 574 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE40)</li> <li>• 802.11ax (5GHz): 3.6 to 1,201 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE80)</li> </ul>	
802.11n/ac/ax packet aggregation:	A-MPDU, A-MSDU	
Transmit power:	Configurable in increments of 0.5 dBm	
Maximum (aggregate, conducted total) transmit power (limited by local regulatory requirements):	2.4 GHz band: +21 dBm (18dBm per chain) 5 GHz band: +21 dBm (18 dBm per chain) Note: conducted transmit power levels exclude antenna gain. For total (EIRP) transmit power, add antenna gain.	



WI-FI ANTENNAS	
AP-504	AP-505 and AP-505S
Two (female) RP-SMA connectors for external dual band antennas (A0 and A1, corresponding with radio chains 0 and 1). Worst-case internal loss between radio interface and external antenna connectors (due to duplexing circuitry): 0.7dB in 2.4GHz and 1.3dB in 5GHz.	Two integrated dual-band downtilt omni-directional antennas for 2x2 MIMO with peak antenna gain of 4.9dBi in 2.4GHz and 5.7dBi in 5GHz. Built-in antennas are optimized for horizontal ceiling mounted orientation of the AP. The downtilt angle for maximum gain is roughly 30 degrees. <ul style="list-style-type: none"> <li>Combining the patterns of each of the antennas of the MIMO radios, the peak gain of the combined, average pattern is 4.3dBi in 2.4GHz and 5.6dBi in 5GHz.</li> </ul>

OTHER INTERFACES		
Model	AP-504	AP-505 and AP-505S
E0: Ethernet wired network port (RJ-45)	<ul style="list-style-type: none"> <li>Auto-sensing link speed (10/100/1000BASE-T) and MDI/MDX</li> <li>POE-PD: 48Vdc (nominal) 802.3af/at POE (class 3 or 4)</li> <li>802.3az Energy Efficient Ethernet (EEE)</li> </ul>	
DC power interface	12Vdc (nominal, +/- 5%), accepts 2.1mm/5.5mm center-positive circular plug with 9.5mm length	
USB 2.0 host interface (Type A connector)	Capable of sourcing up to 1A / 5W to an attached device	
Bluetooth Low Energy (BLE5.0) and Zigbee (802.15.4) radio	<ul style="list-style-type: none"> <li>BLE: up to 7dBm transmit power (class 1) and -93dBm receive sensitivity (1Mbps)</li> <li>Zigbee<sup>1</sup>: up to 6dBm transmit power and -96dBm receive sensitivity</li> </ul> Integrated <sup>1</sup> vertically polarized omnidirectional antenna with roughly 30 degrees downtilt and peak gain of 3.3dBi	
Visual indicators (two multi-color LEDs):	For System and Radio status	
Reset button:	Factory reset, LED mode control (normal/off)	
Serial console interface	Proprietary, micro-B USB physical jack	
Security slot	Kensington security slot	

POWER SOURCES AND POWER CONSUMPTION		
Model	AP-504	AP-505 and AP-505S
Power Sources: The AP supports direct DC power and Power over Ethernet	<ul style="list-style-type: none"> <li>The AP supports direct DC power and Power over Ethernet</li> <li>When both DC and POE power sources are available, DC power takes priority over POE</li> <li>Power sources are sold separately; see the 500 Series Ordering Guide for details</li> <li>When powered by DC or 802.3at (class 4) POE, the AP will operate without restrictions.</li> <li>When powered by 802.3af (class 3) POE and with the IPM feature disabled, the AP will disable the USB port. In the same configuration but with IPM enabled, the AP will start up in unrestricted mode, but may dynamically apply restrictions depending on the POE budget and actual power. The feature restrictions and order can be programmed.</li> </ul>	
Maximum (worst-case) power consumption (without / with a USB device attached):	<ul style="list-style-type: none"> <li>DC powered: 8.9W / 14.2W.</li> <li>POE powered (802.3at): 11.0W / 16.5W.</li> <li>POE powered (802.3af): 11.0W / 13.5W.</li> <li>This assumes that up to 5W is supplied to the attached USB device.</li> </ul>	
Maximum (worst-case) power consumption in idle mode:	4.3W (DC) or 6.2W (POE).	
Maximum (worst-case) power consumption in deep-sleep mode:	1.7W (DC) or 3.7W (POE) <sup>1</sup> .	

<sup>1</sup> AP-504 and AP-505 models include integrated Bluetooth and Zigbee radios. The AP-505S model can support IoT via the USB port extension if desired.



MECHANICAL SPECIFICATIONS	
<b>Model</b>	<b>AP-505 and AP-505S</b>
Dimensions/weight (AP-505; unit, excluding mount bracket):	160mm (W) x 161 mm (D) x 37mm (H) 500g
Dimensions/weight (AP-505; shipping):	193mm (W) x 183mm (D) x 63mm (H) 645g
Mounting details	A mounting bracket has been pre-installed on the back of the AP. This bracket is used to secure the AP to any of the mount kits (sold separately); see the 500 Series Ordering Guide for details.

ENVIRONMENTAL SPECIFICATIONS		
Model	AP-504	AP-505 and AP-505S
Operating conditions	<ul style="list-style-type: none"> <li>• Temperature: 0C to +50C / +32F to +122F</li> <li>• Humidity: 5% to 93% non-condensing</li> <li>• AP is plenum rated for use in air-handling spaces</li> <li>• ETS 300 019 class 3.2 environments</li> </ul>	
Storage and transportation conditions	<ul style="list-style-type: none"> <li>• Temperature: -40C to +70C / -40F to +158F</li> <li>• Humidity: 5% to 93% non-condensing</li> <li>• ETS 300 019 classes 1.2 and 2.3 environments</li> </ul>	

RELIABILITY		
Model	AP-504	AP-505 and AP-505S
Mean Time Between Failure (MTBF):	1.3Mhrs (148yrs) at +25C operating temperature.	

REGULATORY AND SAFETY COMPLIANCE		
Model	AP-504	AP-505 and AP-505S
Regulatory model numbers	APIN0504	APIN0505
Minimum ArubaOS Release	ArubaOS and Aruba InstantOS 8.6.0.0. AP-505S requires 8.10.0.0 or later..	
Regulatory compliance (For more country-specific regulatory information and approvals, please see your Aruba representative.)	<ul style="list-style-type: none"> <li>• FCC/ISED</li> <li>• CE Marked</li> <li>• RED Directive 2014/53/EU</li> <li>• EMC Directive 2014/30/EU</li> <li>• Low Voltage Directive 2014/35/EU</li> <li>• UL/IEC/EN 60950</li> <li>• EN 60601-1-1, EN60601-1-2</li> </ul>	<ul style="list-style-type: none"> <li>• Railway Certs (AP-505 Only): <ul style="list-style-type: none"> <li>- EN 50155:2017 - Railway Applications</li> <li>- EN 50121-1:2017 – Railway EMC</li> <li>- EN 50121-3-2 – Railway EMC</li> <li>- EN 50121-4:2016 - Railway Immunity</li> <li>- IEC 61373 ed2:2008 - Railway Shock and Vibration</li> </ul> </li> </ul>
Certifications	<ul style="list-style-type: none"> <li>• UL2043 plenum rating</li> <li>• Wi-Fi Alliance: <ul style="list-style-type: none"> <li>- Wi-Fi CERTIFIED a, b, g, n, ac</li> <li>- Wi-Fi CERTIFIED 6 (ax)</li> <li>- WPA, WPA2 and WPA3 – Enterprise with CNSA option, Personal (SAE), Enhanced Open (OWE)</li> <li>- WMM, WMM-PS, Wi-Fi Vantage, W-Fi Agile Multiband</li> <li>- Wi-Fi Location</li> <li>- Passpoint (release 2)</li> </ul> </li> <li>• Bluetooth SIG</li> <li>• Ethernet Alliance (POE, PD device, class 4)<sup>1</sup></li> </ul>	

<sup>1</sup> AP-504 and AP-505 models include integrated Bluetooth and Zigbee radios. The AP-505S model can support IoT via the USB port extension if desired.



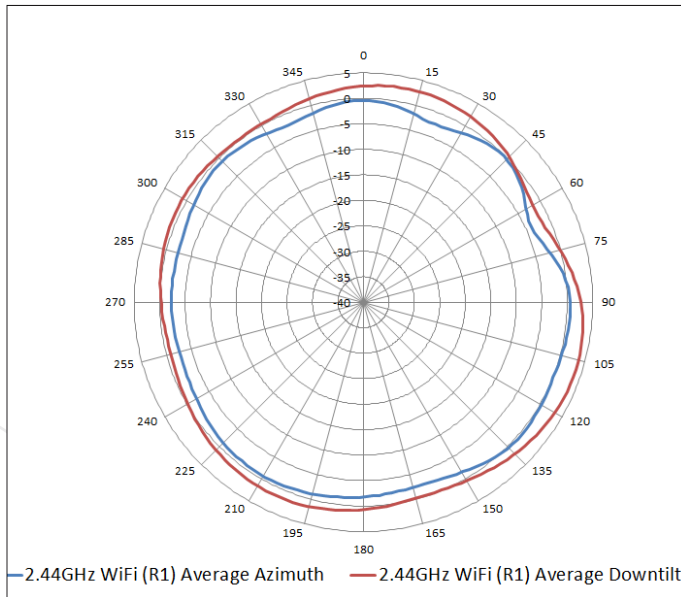
RF PERFORMANCE TABLE		
Band, rate	Maximum transmit power (dBm) per transmit chain	Receiver sensitivity (dBm) per receive chain
<b>2.4GHz, 802.11b</b>		
1Mbps	18	-98
11Mbps	18	-90
<b>2.4GHz, 802.11g</b>		
6Mbps	18	-93
54Mbps	18	-76
<b>2.4GHz, 802.11n HT20</b>		
MCS0	18	-93
MCS7	16	-75
<b>2.4GHz, 802.11ax HE20</b>		
MCS0	18	-93
MCS11	14	-62
<b>5GHz, 802.11a</b>		
6Mbps	18	-92
54Mbps	18	-75
<b>5GHz, 802.11n HT20</b>		
MCS0	18	-92
MCS7	16	-74
<b>5GHz, 802.11n HT40</b>		
MCS0	18	-90
MCS7	16	-71
<b>5GHz, 802.11ac VHT20</b>		
MCS0	18	-92
MCS9	16	-69
<b>5GHz, 802.11ac VHT40</b>		
MCS0	18	-90
MCS9	16	-65
<b>5GHz, 802.11ac VHT80</b>		
MCS0	18	-87
MCS9	16	-62
<b>5GHz, 802.11ax HE20</b>		
MCS0	18	-93
MCS11	14	-62
<b>5GHz, 802.11ax HE40</b>		
MCS0	18	-90
MCS11	14	-59
<b>5GHz, 802.11ax HE80</b>		
MCS0	18	-87
MCS11	14	-56



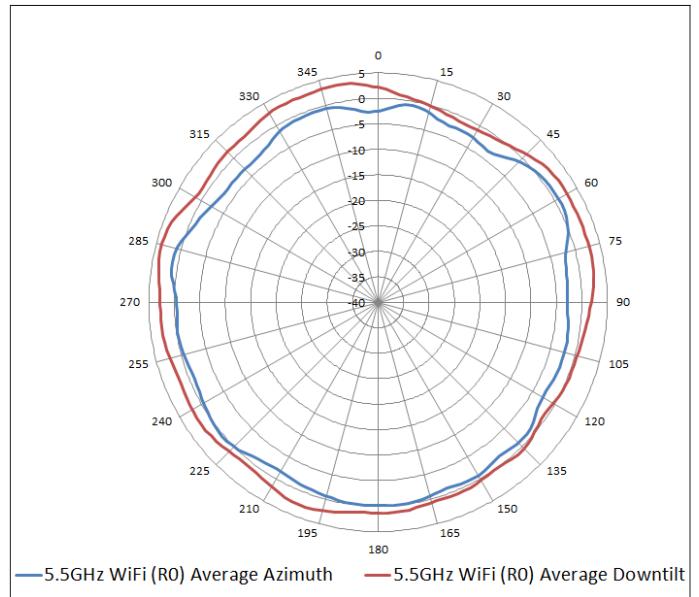
## ANTENNA PATTERNS (AP-505 AND AP-505S)

### Horizontal planes (top view)

Showing azimuth (0 degrees) and 30 degrees downtilt patterns (averaged patterns for all applicable antennas)



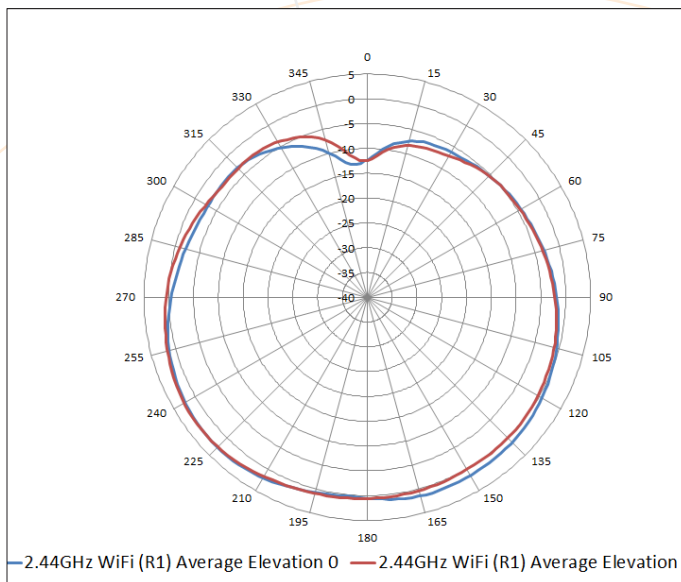
2.44GHz Wi-Fi (antennas 1, 2)



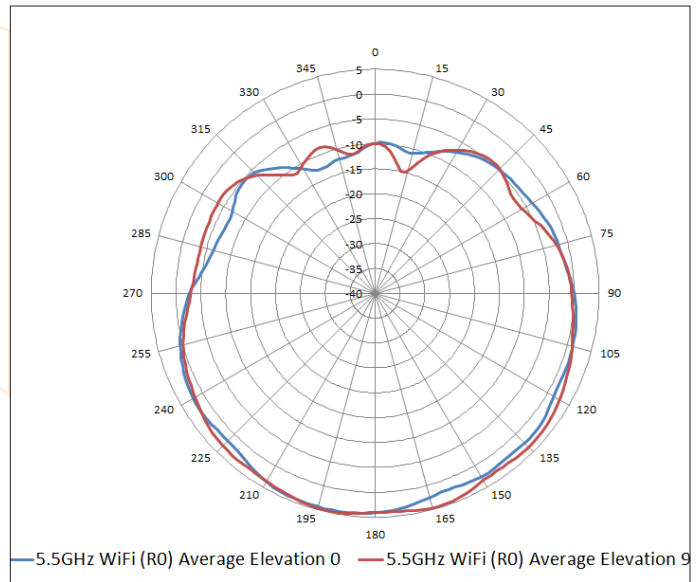
5.5GHz Wi-Fi (antennas 1, 2)

### Vertical (elevation) planes (side view, AP facing down)

Showing side view with AP rotated 0 and 90 degrees (averaged patterns for all applicable antennas)



2.44GHz Wi-Fi (antennas 1, 2)



5.5GHz Wi-Fi (antennas 1, 2)





ORDERING INFORMATION	
Part number	Description
<b>Aruba 500 Series Campus Access Points</b>	
<b>Internal antenna access points</b>	
R2H25A	Aruba AP-505 (EG) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H26A	Aruba AP-505 (IL) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H27A	Aruba AP-505 (JP) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H28A	Aruba AP-505 (RW) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H29A	Aruba AP-505 (US) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R9E68A	Aruba AP-505S (RW) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R9E69A	Aruba AP-505S (US) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
<b>External antenna access points</b>	
R2H19A	Aruba AP-504 (EG) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H20A	Aruba AP-504 (IL) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H21A	Aruba AP-504 (JP) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H22A	Aruba AP-504 (RW) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H23A	Aruba AP-504 (US) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
<b>Internal antenna access points – TAA models</b>	
R2H35A	Aruba AP-505 (EG) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H36A	Aruba AP-505 (IL) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H37A	Aruba AP-505 (JP) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H38A	Aruba AP-505 (RW) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H39A	Aruba AP-505 (US) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
<b>External antenna access points – TAA models</b>	
R2H30A	Aruba AP-504 (EG) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H31A	Aruba AP-504 (IL) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H32A	Aruba AP-504 (JP) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H33A	Aruba AP-504 (RW) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H34A	Aruba AP-504 (US) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
For compatible accessories, see the 500 Series Ordering Guide	

**Resources:**

1. 500 Series Ordering Guide
2. Aruba Access Points webpage

