The bridge to possible

Cisco Catalyst 9115 Series Wi-Fi 6 Access Points

Contents

The Cisco® Catalyst® 9115 Series with Wi-Fi 6is the next generation of enterprise access points. They are resilient, secure, and intelligent.

Hyperconnectivity with steady performance in demanding environments. Exponential growth of Internet of Things (IoT) devices and next-generation applications. Advanced persistent security threats. All of these require a wireless network that provides resiliency and superior connectivity, integrated security with advanced classification and containment, and hardware and software innovations to automate, secure, and simplify networks. Updating your wireless infrastructure to one that will meet these needs is paramount for today's digital business. The new generation of Cisco Catalyst 9100 Access Points, with high-performance Wi-Fi 6 (802.11ax) capabilities and innovations in RF performance, security, and analytics, enables end-to-end digitization and helps accelerate the rollout of business services by delivering beyond Wi-Fi.

Extending Cisco's intent-based network and perfect for networks of all sizes, the Catalyst 9115 Series scales to meet the growing demands of IoT while fully supporting the latest innovations and new technologies. The Catalyst 9115 Series is also a leader in performance, security, and analytics.

The Catalyst 9115 Series Access Points, paired with the Cisco Digital Network Architecture (Cisco DNA), are enterprise-class products that will address both your current and future needs. They are the first step in updating your network to take better advantage of all of the features and benefits that Wi-Fi 6 provides.

With the Catalyst 9115 Series, you can secure remote workers or the micro-office. Any Cisco Aironet or Catalyst access point can function as an OfficeExtend Access Point (OEAP). With an OEAP, an employee at home or in a temporary micro-office will have access to the corporate SSID and the corporate network without the need to set up a VPN or have any advanced technical know-how.

Table 1.   Features and benefits

Feature	Benefits
802.11ax (Wi-Fi 6)	The IEEE 802.11ax emerging standard, also known as High-Efficiency-Wireless (HEW) or Wi-Fi 6, builds on 802.11ac. It will deliver a better experience in typical environments and more predictable performance for advanced applications such as 4K or 8K video, high-density, high-definition collaboration apps, all-wireless offices, and IoT. 802.11ax is designed to use both the 2.4-Ghz and 5-GHz bands, unlike the 802.11ac standard.
Uplink/downlink OFDMA	OFDMA-based scheduling splits the bandwidth into smaller chunks called Resource Units (RUs), which can be allocated to individual clients in both the downlink and uplink directions to reduce overhead and latency.
MU-MIMO technology	Supporting four spatial streams, MU-MIMO enables access points to split spatial streams between client devices, to maximize throughput.
BSS coloring	Spatial reuse (also known as Basic Service Set [BSS] coloring) allows the Access Points (APs) and their clients to differentiate between BSSs, thus permitting more simultaneous transmissions.
Target wake time	A new power savings mode called Target Wake Time (TWT) allows the client to stay asleep and to wake up only at prescheduled (target) times to exchange data with the AP. This offers significant energy savings for battery-operated devices, up to 3x to 4x compared to 802.11n and 802.11ac.
Cisco Embedded Wireless Controller	The 9115 Wi-Fi 6 access points are available with a built-in controller. The Cisco Embedded Wireless Controller on Catalyst 9100 Access Points provides an easy-to-deploy and manage option that does not require a physical appliance. The control resides on the access point, so there is no added footprint or complexity. And because it uses Cisco Catalyst 9800 Series code, it's easy to migrate your network as your needs grow. For more details refer to EWC
User Defined Network	A feature available in Cisco DNA Center, allows IT to give end users control of their very own wireless network partition on a shared network. End users can then remotely and securely deploy their devices on this network. Perfect for university dormitories or extended hospital stays, Cisco User Defined Network grants both device security and control, allowing each user to choose who can connect to their network. (Available second half of calendar year 2020.) For more details refer to UDN.
Application Hosting on Catalyst 9100 Access	Application Hosting on Catalyst 9100 Access Points helps future-proof and simplify IoT deployments by eliminating the need to install and manage overlay networks. Utilizing the USB interface, containerized applications and hardware modules can be deployed to reduce cost and complexity. Adding Cisco DNA Center provides workflows and deployment-wide application lifecycle management.
Multigigabit Ethernet support	Provides uplink speeds of 2.5 Gbps, in addition to 100 Mbps and 1 Gbps. All speeds are supported on Category 5e cabling for an industry first, as well as 10GBASE-T (IEEE 802.3bz) cabling.
Bluetooth 5.0	Integrated Bluetooth Low Energy (BLE) 5.0 radio to enable IoT use cases such as location tracking and wayfinding.

Feature	Benefits
Apple features	Apple and Cisco have partnered to create an optimal mobile experience for iOS devices on corporate networks based on Cisco technologies. Using new features in iOS 10, in combination with the latest software and hardware from Cisco, businesses can now more effectively use their network infrastructure to deliver an enhanced user experience across all business applications. At the center of the collaboration is a unique handshake between the Cisco WLAN and Apple devices. This handshake enables the Cisco WLAN to provide an optimal Wi-Fi roaming experience to Apple devices. Additionally, the Cisco WLAN trusts Apple devices and gives priority treatment for business-critical applications specified by the Apple device. This feature is also known as Fast Lane.

For more details about Wi-Fi 6, see [Cisco's technical white paper](#) on Wi-Fi 6.

For more details about C9115 feature support, see [Cisco's Feature Matrix](#).

Secure infrastructure

Trustworthy systems built with Cisco Trust Anchor Technologies provide a highly secure foundation for Cisco products. With the Cisco Catalyst 9100 Access Points, these technologies enable hardware and software authenticity assurance for supply chain trust and strong mitigation against man-in-the-middle attacks that compromise software and firmware. Trust Anchor capabilities include:

- **Image signing**
- **Secure Boot**
- **Cisco Trust Anchor module**

Cisco DNA Software support

Pairing the Cisco Catalyst 9115 Series Access Points with Cisco DNA Software allows for a total network transformation. Cisco DNA Software allows you to truly understand your network with real-time analytics, quickly detect and contain security threats, and easily provide networkwide consistency through automation and virtualization. The Catalyst 9115 Series Access Points support SD-Access, Cisco's leading enterprise architecture.

Working together, the Cisco Catalyst 9115 Series and Cisco DNA Software offer such features as:

- Cisco DNA Spaces
- Cisco Identity Services Engine
- Cisco DNA Analytics and Assurance

The result? Your network stays relevant, becomes digital ready, and is the lifeblood of your organization.

Note: For information about Cisco DNA Software, refer to [Cisco DNA Software](#) for Wireless

Product specifications

Table 2.   Specifications

Item	Specification
Part numbers	**Cisco Catalyst 9115AXI Access Point: Indoor environments, with internal antennas** • C9115AXI-x: Cisco Catalyst 9115 Series **Cisco Catalyst 9115AXE Access Point: Indoor, challenging environments, with external antennas** • C9115AXE-x: Cisco Catalyst 9115 Series **Cisco Catalyst 9115AXI Access Point: Indoor environments, with internal antennas, with embedded wireless controller** • C9115AXI-EWC-x: Cisco Catalyst 9115 Series **Cisco Catalyst 9115AXE Access Point: Indoor, challenging environments, with external antennas, with embedded wireless controller** • C9115AXE-EWC-x: Cisco Catalyst 9115 Series **Regulatory domains: (x = regulatory domain)** Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit https://www.cisco.com/go/aironet/compliance. Not all regulatory domains have been approved. As they are approved, the part numbers will be available on the Global Price List. **Cisco Wireless LAN Services** • AS-WLAN-CNSLT: Cisco Wireless LAN Network Planning and Design Service • AS-WLAN-CNSLT: Cisco Wireless LAN 802.11n Migration Service • AS-WLAN-CNSLT: Cisco Wireless LAN Performance and Security Assessment Service
Software	• Cisco Unified Wireless Network Software Release 8.9 or later • Cisco IOS® XE Software Release 16.11 or later
Supported wireless LAN controllers	• Cisco Catalyst 9800 Series Wireless Controllers • Cisco 3500, 5520, and 8540 Series Wireless Controllers and Cisco Virtual Wireless Controller
802.11n version 2.0 (and related) capabilities	• 4x4 MIMO with four spatial streams • Maximal Ratio Combining (MRC) • 802.11n and 802.11a/g beamforming • 20- and 40-MHz channels • PHY data rates up to 890 Mbps (40 MHz with 5 GHz and 20 MHz with 2.4 GHz) • Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • 802.11 Dynamic Frequency Selection (DFS) • Cyclic Shift Diversity (CSD) support

Item	Specification
802.11ac	• 4x4 downlink MU-MIMO with four spatial streams • MRC • 802.11ac beamforming • 20-, 40-, 80-, and 160-MHz channels • PHY data rates up to 3.47 Gbps (160 MHz with 5 GHz) • Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • 802.11 DFS • CSD support
802.11ax	• 4x4 downlink MU-MIMO with four spatial streams • Uplink/downlink OFDMA • TWT • BSS coloring • MRC • 802.11ax beamforming • 20-, 40-, 80-, and 160-MHz channels • PHY data rates up to 5.38 Gbps (160 MHz with 5 GHz and 20 MHz with 2.4 GHz) • Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • 802.11 DFS • CSD support
Integrated antenna	• 2.4 GHz, peak gain 3 dBi, internal antenna, omnidirectional in azimuth • 5 GHz, peak gain 4 dBi, internal antenna, omnidirectional in azimuth
External antenna (sold separately)	• Cisco Catalyst 9115E Access Points are certified for use with antenna gains up to 6 dBi (2.4 GHz and 5 GHz) • Cisco offers the industry's broadest selection of antennas, delivering optimal coverage for a variety of deployment scenarios • For more details, C9115 Guide
Interfaces	• 1x 100, 1000, 2500 Multigigabit Ethernet (RJ-45) – IEEE 802.3bz • Management console port (RJ-45) • USB 2.0
Indicators	• Status LED indicates boot loader status, association status, operating status, boot loader warnings, and boot loader errors
Dimensions (W x L x H)	• Access point (without mounting brackets): C9115I: 8.0 x 8.0 x 1.5 in. (20.3 x 20.3 x 3.8 cm), C9115E: 8.0 x 8.0 x 1.7 in. (20.3 x 20.3 x 4.3 cm)
Weight	**Cisco Catalyst 9115AXI** • 1.98 lb (0.9 kg) **Cisco Catalyst 9115AXE** • 2.43 lb (1.1 kg)
Input power requirements	• 802.3at Power over Ethernet Plus (PoE+), 802.3bt Cisco Universal PoE (Cisco UPOE+, Cisco UPOE®) • Cisco power injector, AIR-PWRINJ6= • 802.3af PoE • Cisco power injector, AIR-PWRINJ5= (Note: This injector supports only 802.3af) **Note:** When 802.3af PoE is the source of power, both 2.4-GHz and 5-GHz radios will be reduced to 2x2 and Ethernet downgraded to 1 Gigabit Ethernet. In addition, the USB port will be off.

Item	Specification
Power draw	**802.3at full feature – Catalyst 9115I**

Power source	Power type	2.4-GHz radio	5-GHz radio	Link speed	USB	LLDP
802.3at	PoE	4x4	4x4	2.5G	Y	20.4W

802.3at full feature – Catalyst 9115E

Power source	Power type	2.4-GHz radio	5-GHz radio	Link speed	USB	LLDP
802.3at	PoE	4x4	4x4	2.5G	Y	21.4W

802.3af reduced feature

Power source	Power type	2.4-GHz radio	5-GHz radio	Link speed	USB	LLDP
802.3af	PoE	2x2	2x2	1G	N	13W

Note: Power required at the Power Source Equipment (PSE) will depend on the cable length and other environmental issues.

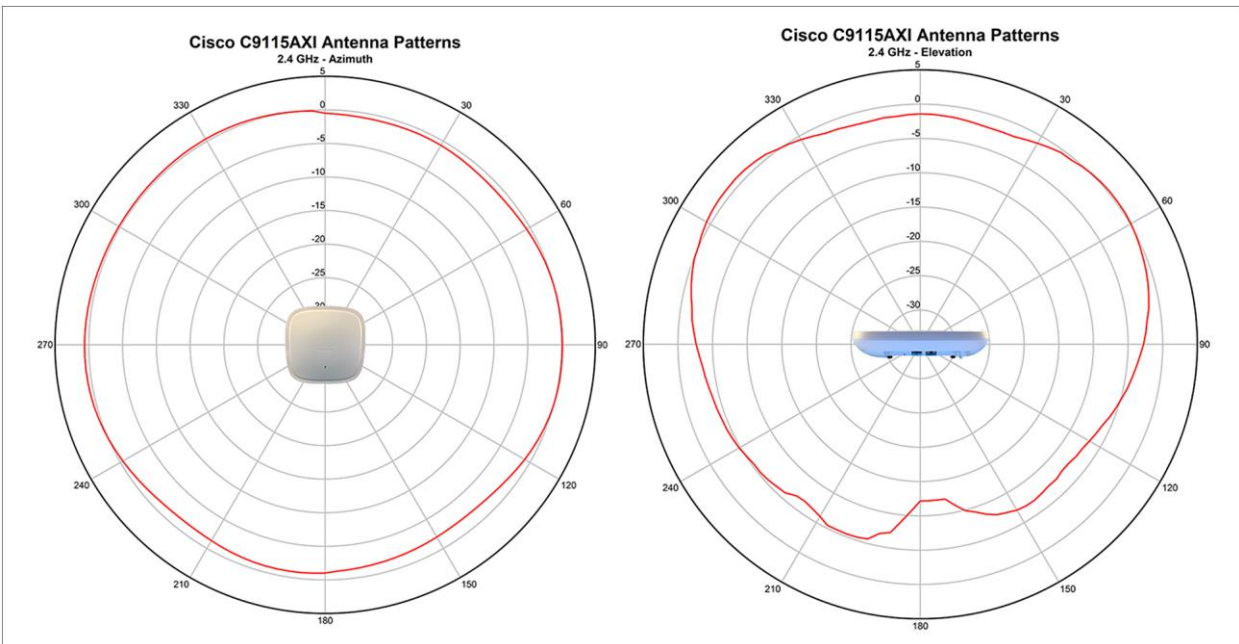| Item	Specification
Environmental	**Cisco Catalyst 9115AXI** • Nonoperating (storage) temperature: –22° to 158°F (–30° to 70°C) • Nonoperating (storage) altitude test: 25°C, 15,000 ft. • Operating temperature: 32° to 122°F (0° to 50°C) • Operating humidity: 10% to 90% (noncondensing) • Operating altitude test: 40°C, 9843 ft. **Note:** When the ambient operating temperature exceeds 40°C, the access point will shift from 4x4 to 2x2 on both the 2.4-GHz and 5-GHz radios, uplink Ethernet will downgrade to 1 Gigabit Ethernet, and the USB interface will be disabled. **Cisco Catalyst 9115AXE** • Nonoperating (storage) temperature: –22° to 158°F (–30° to 70°C) • Nonoperating (storage) altitude test: 25°C, 15,000 ft. • Operating temperature: –4° to 122°F (–20° to 50°C) • Operating humidity: 10% to 90% (noncondensing) • Operating altitude test: 40°C, 9843 ft.
System memory	• 2048 MB DRAM • 1024 MB flash
Warranty	Limited lifetime hardware warranty
Available transmit power settings	**2.4 GHz** • 23 dBm (200 mW) • –4dBm (0.39mW) | **5 GHz** • 23 dBm (200 mW) • –4dBm (0.39mW)
Regulatory domains	Note: **Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit https://www.cisco.com/go/aironet/compliance**

Item	Specification	
	For information about Regulatory Domain support, refer to the Cisco Regulatory Domain White Paper	

Compliance standards	• **Safety:**
	  ◦ IEC 60950-1
	  ◦ EN 60950-1
	  ◦ UL 60950-1
	  ◦ CAN/CSA-C22.2 No. 60950-1
	  ◦ AS/NZS 60950-1
	  ◦ UL 2043
	  ◦ Class III equipment
	• **Emissions:**
	  ◦ CISPR 32 (rev. 2015)
	  ◦ EN 55032 (rev. 2012/AC:2013)
	  ◦ EN 55032 (rev. 2015)
	  ◦ EN61000-3-2 (rev. 2014)
	  ◦ EN61000-3-3 (rev. 2013)
	  ◦ KN61000-3-2
	  ◦ KN61000-3-3
	  ◦ AS/NZS CISPR 32 Class B (rev. 2015)
	  ◦ 47 CFR FCC Part 15B
	  ◦ ICES-003 (rev. 2016 Issue 6, Class B)
	  ◦ VCCI (V3)
	  ◦ CNS (rev. 13438)
	  ◦ KN-32
	  ◦ TCVN 7189 (rev. 2009)
	• **Immunity:**
	  ◦ CISPR 24 (rev. 2010)
	  ◦ EN 55024/EN 55035 (rev. 2010)
	• **Emissions and immunity:**
	  ◦ EN 301 489-1 (v2.1.1 2017-02)
	  ◦ EN 301 489-17 (v3.1.1 2017-02)
	  ◦ QCVN (18:2014)
	  ◦ KN 489-1
	  ◦ KN 489-17
	  ◦ EN 60601 (1-1:2015)
	• **Radio:**
	  ◦ EN 300 328 (v2.1.1)
		◦ EN 301 893 (v2.1.1)
		  ◦ AS/NZS 4268 (rev. 2017)
		  ◦ 47 CFR FCC Part 15C, 15.247, 15.407
		  ◦ RSP-100
		  ◦ RSS-GEN
		  ◦ RSS-247
		  ◦ China regulations SRRC
		  ◦ LP0002 (rev 2018.1.10)
		  ◦ Japan Std. 33a, Std. 66, and Std. 71
		• **RF safety:**
		  ◦ EN 50385 (rev. Aug 2002)
		  ◦ ARPANSA
		  ◦ AS/NZS 2772 (rev. 2016)
		  ◦ EN 62209-1 (rev. 2016)
		  ◦ EN 62209-2 (rev. 2010)
		  ◦ 47 CFR Part 1.1310 and 2.1091
		  ◦ RSS-102
		• **IEEE standards:**
		  ◦ IEEE 802.3
		  ◦ IEEE 802.3ab
		  ◦ IEEE 802.3af/at
		  ◦ IEEE 802.11 a/b/g/n/ac/ax
		  ◦ IEEE 802.11h, 802.11d
		• **Security:**
		  ◦ 802.11i, Wi-Fi Protected Access 3 (WPA3), WPA2, WPA
		  ◦ 802.1X
		  ◦ Advanced Encryption Standard (AES)
		• **Extensible Authentication Protocol (EAP) types:**
		  ◦ EAP-Transport Layer Security (TLS)
		  ◦ EAP-Tunneled TLS (TTLS) or Microsoft Challenge Handshake Authentication Protocol Version 2 (MSCHAPv2)
		  ◦ Protected EAP (PEAP) v0 or EAP-MSCHAPv2
		  ◦ EAP-Flexible Authentication via Secure Tunneling (EAP-FAST)
		  ◦ PEAP v1 or EAP-Generic Token Card (GTC)
		  ◦ EAP-Subscriber Identity Module (SIM)

Datarate/Transmit Power/ Receive sensitivity	For more detailed information about Datarate/TX Power/Receive sensitivity, Please refer Cisco RF Details	

Item	Specification				
Transmit power and receive sensitivity					
		5-GHz radio		**2.4-GHz radio**	
	Spatial streams	**Total transmit power (dBm)**	**Receive sensitivity (dBm)**	**Total transmit power (dBm)**	**Receive sensitivity (dBm)**
802.11/11b					
1 Mbps	1	–	–	23	–98
11 Mbps	1	–	–	23	–90
802.11a/g					
6 Mbps	1	23	–96	23	–95
24 Mbps	1	23	–87	23	–85
54 Mbps	1	23	–76	23	–76
802.11n HT20					
MCS0	1	23	–95	23	–94
MCS31	4	23	–70	23	–70
802.11n HT40					
MCS0	1	23	–93	–	–
MCS31	4	23	–68	–	–
802.11ac VHT20					
MCS0	1	23	–95	–	–
MCS9	1	22	NA	–	–
MCS0	2	23	–92	–	–
MCS9	2	22	NA	–	–
MCS0	3	23	–91	–	–
MCS9	3	22	–67	–	–
MCS0	4	23	–90	–	–
MCS9	4	22	–66	–	–

Item		Specification			
802.11ac VHT40					
MCS0	1	23	–89	–	–
MCS9	1	22	–65	–	–
MCS0	2	23	–86	–	–
MCS9	2	22	–62	–	–
MCS0	3	23	–85	–	–
MCS9	3	22	–61	–	–
MCS0	4	23	–84	–	–
MCS9	4	22	–59	–	–
802.11ac VHT80					
MCS0	1	23	–84	–	–
MCS9	1	22	–60	–	–
MCS0	2	23	–81	–	–
MCS9	2	22	–57	–	–
MCS0	3	23	–80	–	–
MCS9	3	22	–55	–	–
MCS0	4	23	–77	–	–
MCS9	4	22	–54	–	–
802.11ac VHT160					
MCS0	1	23	–84	–	–
MCS9	1	21	–59	–	–
MCS0	2	23	–85	–	–
MCS9	2	21	–57	–	–
MCS0	3	23	–85	–	–
MCS9	3	21	–55	–	–
MCS0	4	23	–85	–	–
MCS9	4	21	–53	–	–

Item		Specification			
802.11ax VHT20					
MCS0	1	23	–94	23	–93
MCS11	1	21	–64	20	–62
MCS0	2	23	–91	23	–90
MCS11	2	21	–61	20	–59
MCS0	3	23	–90	23	–88
MCS11	3	21	–60	20	–58
MCS0	4	23	–87	23	–86
MCS11	4	21	–59	20	–57
802.11ax VHT40					
MCS0	1	23	–92	23	–91
MCS11	1	21	–60	20	–60
MCS0	2	23	–89	23	–87
MCS11	2	21	–57	20	–57
MCS0	3	23	–88	23	–85
MCS11	3	21	–56	20	–55
MCS0	4	23	–86	23	–83
MCS11	4	21	–54	20	–54
802.11ax VHT80					
MCS0	1	23	–87	–	–
MCS11	1	21	–58	–	–
MCS0	2	23	–84	–	–
MCS11	2	21	–55	–	–
MCS0	3	23	–83	–	–
MCS11	3	21	–54	–	–
MCS0	4	23	–81	–	–
MCS11	4	21	–52	–	–

Item		Specification			
802.11ax VHT160					
MCS0	1	23	–84	–	–
MCS11	1	20	–55	–	–
MCS0	2	23	–81	–	–
MCS11	2	20	–52	–	–
MCS0	3	23	–80	–	–
MCS11	3	20	–51	–	–
MCS0	4	23	–78	–	–
MCS4	4	23	–67	–	–
MCS7	4	23	–60	–	–
MCS8	4	21	–57	–	–
MCS9	4	21	–55	–	–
MCS10	4	20	–51	–	–
MCS11	4	20	–49	–	–

Cisco C9115AXI Antenna Patterns
2.4 GHz - Azimuth

Cisco C9115AXI Antenna Patterns
2.4 GHz - Elevation
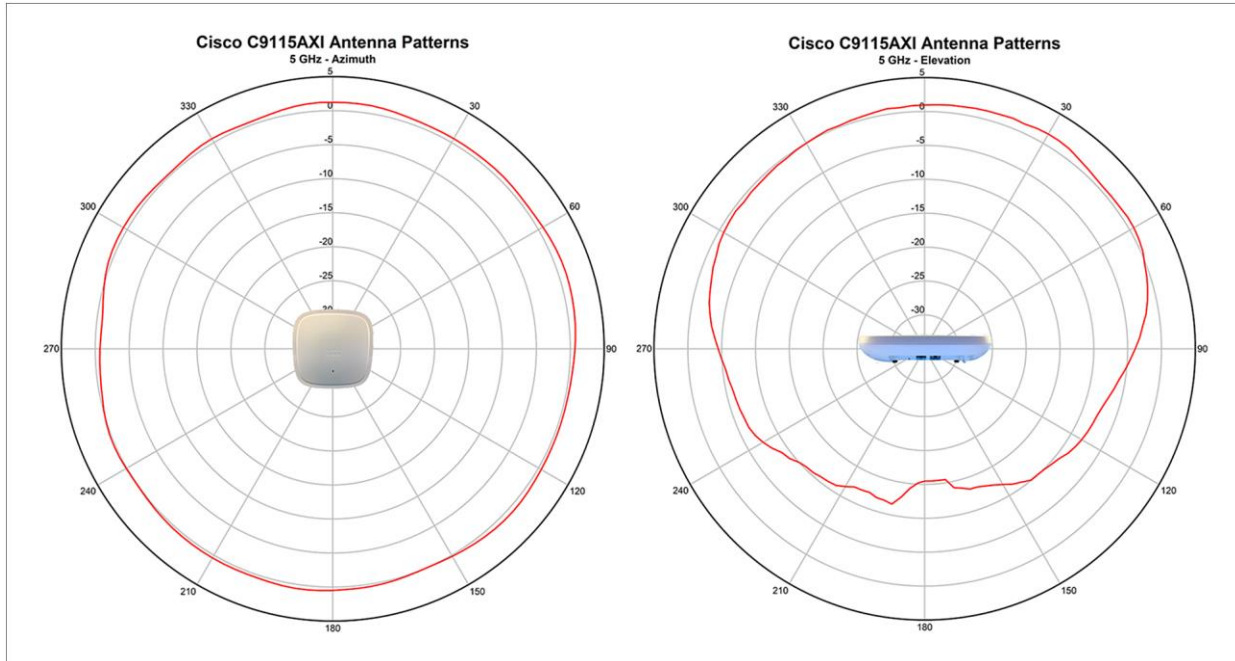
Figure 1.
Antenna radiation pattern

For information about feature support, please refer to the Cisco Catalyst 9100 Release Notes.

Licensing

For information about Licensing and packaging, refer to Cisco DNA Software for Wireless.

Warranty information

The Cisco Catalyst 9115 Series Access Points come with a limited lifetime warranty that provides full warranty coverage of the hardware for as long as the original end user continues to own or use the product. The warranty includes 10-day advance hardware replacement and ensures that software media are defect-free for 90 days. For more details, visit https://www.cisco.com/go/warranty.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report. Reference links to information are below.

Information on product material content laws and regulations - Materials.

Information on electronic waste laws and regulations, including products, batteries, and packaging - WEEE compliance.

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Cisco Services

With Cisco Services, you can achieve infrastructure excellence faster with less risk. From an initial WLAN readiness assessment to implementation, full solution support, and in-depth training, our services for the Cisco Catalyst 9115 Series provide expert guidance to help you successfully plan, deploy, manage, and support your new access points. With unmatched networking expertise, best practices, and innovative tools, Cisco Services can help you reduce overall upgrade, refresh, and migration costs as you introduce new hardware, software, and protocols into the network. With a comprehensive lifecycle of services, Cisco experts will help you minimize disruption and improve operational efficiency to extract maximum value from your Cisco DNA-ready infrastructure.

Cisco Capital

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

Smart Account

Creating Smart Accounts by using the Cisco Smart Software Manager (SSM) enables you to order devices and licensing packages and also manage your software licenses from a centralized website. For more information on Smart Accounts, refer to https://www.cisco.com/go/smartaccounts.

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