Cisco Catalyst 9117 Access Point

Contents

The Cisco® Catalyst® 9117 Access Points are 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.

The Cisco Catalyst 9117 Access Points deliver several features of Wi-Fi 6 while offering high data rates.

Key features:

- Wi-Fi 6 compatible

- Three radios: 2.4 GHz (4x4), 5 GHz (8x8), and BLE

- OFDMA and MU-MIMO

- Multigigabit support

- Internal antenna

- Available with optional embedded wireless controller

The Cisco Catalyst 9117 Access Points support both Orthogonal Frequency-Division Multiple Access (OFDMA) and Multiuser Multiple Input, Multiple Output (MU-MIMO), delivering more predictable performance for advanced applications and IoT. Additionally, with up to 5 Gbps with NBASE-T and IEEE 802.3bz Ethernet compatibility, the Cisco Catalyst 9117 can seamlessly offload network traffic without any bottlenecks. With Cisco's Multigigabit technology, you can use your existing Category 5e or 6 cabling to achieve speeds up to 5 Gbps, allowing for higher throughputs with minimum cost.

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.
802.11ac Wave 2 support	Provides a connection rate of up to 3.5 Gbps—significantly higher than rates offered by today's high-end 802.11ac access points.
OFDMA	OFDMA-based scheduling splits the bandwidth into smaller chunks called Resource Units (RUs), which can be allocated to individual clients only in the downlink direction to reduce overhead and latency.
MU-MIMO technology	Supporting eight spatial streams, MU-MIMO enables access points to split spatial streams between client devices, to maximize throughput.
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.
Embedded Catalyst 9800 Wireless Controller	The Catalyst 9120 Wi-Fi 6 access points is 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 Catalyst 9800 code, it's easy to migrate your network as your needs grow.
Multigigabit Ethernet support	Provides uplink speeds of 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.
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.

Note: Features available in a future releases - Cisco Mobility Express, Target Wake Time, BSS Coloring, Downlink OFDMA

Resilient - steady performance in demanding environments

Networks infrastructure that upgrade to Wi-Fi 6, also known as 802.11ax, enabled devices will get upto 4x capacity boost needed to support the additional devices connected to the network as well as the data that they generate. 802.11ax will offer multi-gigabit performance which will feature a seamless connectivity with higher throughput compared to the 802.11ac standard. This means you'll see your network performance run smoother. With support for BSS coloring, the new standard eases high device dense deployments by allowing simultaneous transmissions, ultimately increasing network capacity, customer interactions, and value-add services.

Wi-Fi 6, with better coordination of transit time to and from devices, will also bring about a reduction in latency and a greater reliability allowing for hundreds of devices per access point. This allows for IoT devices to be reliably deployed at scale. And an overall improved user experience will be seen as well, as 802.11ax will improve device battery life of devices such as smartphones, tablets and IoT when compared to prior standards. For more details about 802.11ax please check Cisco's Technical Whitepaper on 802.11ax.

Secure infrastructure

Trustworthy systems built with Cisco Trust Anchor Technologies provide a highly secure foundation for Cisco products. With The Catalyst 9100 Series, 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:** Cryptographically signed images provide assurance that the firmware, BIOS, and other software are authentic and unmodified. As the system boots, the system's software signatures are checked for integrity.

- **Secure Boot:** Cisco Secure Boot technology anchors the boot sequence chain of trust to immutable hardware, mitigating threats against a system's foundational state and the software that is to be loaded, regardless of a user's privilege level. It provides layered protection against the persistence of illicitly modified firmware.

- **Cisco Trust Anchor module:** A tamper-resistant, strong cryptographic, single-chip solution provides hardware authenticity assurance to uniquely identify the product so that its origin can be confirmed to Cisco. This provides assurance that the product is genuine.

Intelligence for proactive insights and analytics

With multi-RF support paramount for IoT devices and expanded ecosystem partnerships, the Catalyst 9100 portfolio provides unprecedented visibility from mobile devices on Cisco network. Enabling digitization with Cisco DNA Architecture, Catalyst 9100 portfolio further Cisco RF innovations for securing air with real-time telemetry, guided remediation, and optimization for Wi-Fi and IOT networks. The Cisco Catalyst 9100 series access points can support advanced spectrum intelligence, device analytics and network assurance.

Aesthetically redesigned for next generation enterprise

The Catalyst 9100 series access points are built from the ground-up, with new aerodynamic look and smooth finish, integrating RF excellence and next generation technologies to provide the best-in-class wireless experience without compromise. While packing several high performance features, the hardware is re-designed to deliver higher efficiencies in a more compact form-factor to make visually appealing Wi-Fi deployments commonplace.

Cisco DNA Support

Pairing the Cisco Catalyst 9117 Access Points with the Cisco Digital Network Architecture (Cisco DNA) allows for a total network transformation. Cisco DNA 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.

Cisco DNA with Software-Defined Access (SD-Access) is the network fabric that powers business. It is an open and extensible, software-driven architecture that accelerates and simplifies your enterprise network operations. The programmable architecture frees your IT staff from time-consuming, repetitive network configuration tasks so they can focus instead on innovation that positively transforms your business. By decoupling network functions from the hardware, you can build and manage your entire wired and wireless network from a single user interface. SD-Access enables policy-based automation from edge to cloud with foundational capabilities. These include:

- Simplified device deployment
- Unified management of wired and wireless networks
- Network virtualization and segmentation
- Group-based policies
- Context-based analytics

The Cisco Catalyst 9117 Access Points support Software-Defined Access, Cisco's leading enterprise architecture.

Working together, the Cisco Catalyst 9117 and Cisco DNA offer such features as:

- Cisco DNA Spaces
- Cisco Identity Services Engine
- Cisco DNA Analytics and Assurance
- And much more

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

Product specifications

Item	Specification
Part numbers	**Cisco Catalyst 9117AXI Access Point: Indoor environments, with internal antennas** • C9117AXI-x: Cisco Catalyst 9117 **Cisco Catalyst 9117AXI Access Point: Indoor environments, with internal antennas, with embedded wireless controller** • C9117AXI-EWC-x: Cisco Catalyst 9117 **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	• 8x8 MIMO with four spatial streams for 5-GHz band • 4x4 MIMO with four spatial streams for 2.4-GHz band • Maximal Ratio Combining (MRC) • 20- and 40-MHz channels • PHY data rates up to 600 Mbps (40 MHz with 5 GHz) • Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • Cyclic Shift Diversity (CSD) support
802.11ac	• 8x8 downlink MU-MIMO with eight spatial streams • MRC • 802.11ac beamforming • 20-, 40-, 80, and 160-MHz channels • PHY data rates up to 3.5 Gbps at 5 GHz • Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • CSD support
802.11ax	• 8x8 MIMO with eight spatial streams for 5-GHz band • 4x4 MIMO with four spatial streams for 2.4-GHz band • Downlink OFDMA • TWT • MRC • 802.11ax beamforming • 20-, 40-, 80, and 160-MHz channels • PHY data rates up to 5 Gbps at 5 GHz

Item	Specification
	• Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • CSD support
Integrated antenna	• 2.4 GHz, peak gain 4 dBi, internal antenna, omnidirectional in azimuth • 5 GHz, peak gain 6 dBi, internal antenna, omnidirectional in azimuth
Interfaces	• 1x 100, 1000, 2500, 5000 Multigigabit Ethernet (RJ-45) – IEEE 802.3bz • Management console port (RJ-45) • USB 2.0 with up to 3.75W (enabled via future software)
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 bracket and mounting features): 8.70 x 8.70 x 1.94 in. (22 x 22 x 4.93 cm) • Access point (without mounting bracket): 8.70 x 8.70 x 2.19 in. (22 x 22 x 5.56 cm)
Weight	• 3.02 lb (1.4 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 2.5 Gbps; in addition, the USB port will be off.
Power draw	802.3bt Cisco UPoE+ Cisco UPoE Full Feature

Power source	Power type	2.4-GHz radio	5-GHz radio	Link speed	USB	LLDP
802.3bt Cisco UPoE+, Cisco UPoE	PoE	4x4	8x8	5 Gbps	Y	28.9W

802.3at Full Feature[*]

Power source	Power type	2.4-GHz radio	5-GHz radio	Link speed	USB	LLDP
802.3at	PoE	4x4	8x8	5 Gbps	N	25.4W

802.3af Reduced Feature

Power source	Power type	2.4-GHz radio	5-GHz radio	Link speed	USB	LLDP
802.3af	PoE	2x2	2x2	2.5 Gbps	N	13.5W

USB port can be enabled, but the 5-GHz radio will be reduced to 4x4.

Item	Specification	
Environmental	• 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.	
System memory	• 2048 MB DRAM • 1024 MB flash	
DFS	• 802.11 dynamic frequency selection (DFS)	
Warranty	Limited lifetime hardware warranty	
Available transmit power settings	**2.4 GHz** • 23 dBm (200 mW) • 20 dBm (100 mW) • 17 dBm (50 mW) • 14 dBm (25 mW) • 11 dBm (12.5 mW) • 8 dBm (6.25 mW) • 5 dBm (3.13 mW) • 2 dBm (1.56 mW) • -1 dBm (0.78 mW) • -4 dBm (0.4 mW) • -6 dBm (0.25 mW)	**5 GHz** • 26 dBm (400 mW) • 23 dBm (200 mW) • 20 dBm (100 mW) • 17 dBm (50 mW) • 14 dBm (25 mW) • 11 dBm (12.5 mW) • 8 dBm (6.25 mW) • 5 dBm (3.13 mW) • 2 dBm (1.56 mW) • -1 dBm (0.78 mW) • -4 dBm (0.4 mW)
Frequency band and 20-MHz operating channels	**A (A regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) • 5.745 to 5.825 GHz; 5 channels **B (B regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 11 channels • 5.745 to 5.865 GHz; 7 channels **C (C regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.745 to 5.825 GHz; 5 channels **D (D regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.745 to 5.825 GHz; 5 channels **E (E regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels	**I (I regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels **K (K regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.620 GHz; 7 channels • 5.745 to 5.805 GHz; 4 channels **N (N regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.745 to 5.825 GHz; 5 channels **Q (Q regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 11 channels **R (R regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.660 to 5,825 GHz; 8 channels (excludes 5.700 to 5.745 GHz)

Item	Specification	
	• 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) **F (F regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.745 to 5.805 GHz; 4 channels **G (G regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.745 to 5.865 GHz; 7 channels **H (H regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.745 to 5.825 GHz; 5 channels	**S (S regulatory domain):** • 2.412 to 2.472 GHz; 13 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 11 channels • 5.745 to 5.825 GHz; 5 channels **T (T regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 12 channels • 5.745 to 5.825 GHz; 5 channels **Z (Z regulatory domain):** • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.320 GHz; 8 channels • 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz) • 5.745 to 5.825 GHz; 5 channels
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.		

Maximum number of nonoverlapping channels	**2.4 GHz**
	
	• 802.11b/g:
	  ◦ 20 MHz: 3
	• 802.11n:
	  ◦ 20 MHz: 3
	• 802.11ac/ax:
	  ◦ 20 MHz: 3
		5 GHz
		
		• 802.11a:
		  ◦ 20 MHz: 26 FCC, 16 EU
		• 802.11n:
		  ◦ 20 MHz: 26 FCC, 16 EU
		  ◦ 40 MHz: 12 FCC, 7 EU
		• 802.11ac/ax:
		  ◦ 20 MHz: 26 FCC, 16 EU
		  ◦ 40 MHz: 12 FCC, 7 EU
		  ◦ 80 MHz: 5 FCC, 3 EU
		  ◦ 160 MHz 2 FCC, 1 EU

Note: **This varies by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.**		

Compliance standards	• **Safety:**
	  ◦ IEC 60950-1
	  ◦ EN 60950-1
	  ◦ AS/NZS 60950.1
	  ◦ UL 60950-1
	  ◦ CAN/CSA-C22.2 No. 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)	

Item	Specification
	◦ 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
	◦ EMI and susceptibility (Class B)
	● **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/bt
	◦ IEEE 802.11 a/b/g/n/ac/ax
	◦ IEEE 802.11h, 802.11d

Item	Specification

	• **Security:**
	  ◦ 802.11i, Wi-Fi Protected Access 2 (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)

Data rates supported	802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps
	802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps
	802.11n data rates on 2.4 GHz (only 20 MHz) and 5 GHz

MCS Index[1]	GI[2] = 800 ns	GI = 800 ns	GI = 400 ns	GI = 400 ns
	20-MHz rate (Mbps)	40-MHz rate (Mbps)	20-MHz rate (Mbps)	40-MHz rate (Mbps)
0	6.5	13.5	7.2	15
1	13	27	14.4	30
2	19.5	40.5	21.7	45
3	26	54	28.9	60
4	39	81	43.3	90
5	52	108	57.8	120
6	58.5	121.5	65	135
7	65	135	72.2	150
8	13	27	14.4	30
9	26	54	28.9	60
10	39	81	43.3	90
11	52	108	57.8	120

[1] MCS Index: The Modulation and Coding Scheme (MCS) index determines the number of spatial streams, the modulation, the coding rate, and data rate values.

[2] GI: A guard interval (GI) between symbols helps receivers overcome the effects of multipath delay spreads.

Item	Specification			
12	78	162	86.7	180
13	104	216	115.6	240
14	117	243	130	270
15	130	270	144.4	300
16	19.5	40.5	21.7	45
17	39	81	43.3	90
18	58.5	121.5	65	135
19	78	162	86.7	180
20	117	243	130	270
21	156	324	173.3	360
22	175.5	364.5	195	405
23	195	405	216.7	450
24	26	54	28.9	60
25	52	108	57.8	120
26	78	162	86.7	180
27	104	216	115.6	240
28	156	324	173.3	360
29	208	432	231.1	480
30	234	486	260	540
31	260	540	288.9	600

Item	Specification								
	802.11ac data rates (5 GHz):								
	MCS Index	Spatial streams	GI = 800 ns				GI = 400 ns			
			20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)	20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)
	0	1	6.5	13.5	29.3	58.5	7.2	15	32.5	65
	1	1	13	27	58.5	117	14.4	30	65	130
	2	1	19.5	40.5	87.8	175.5	21.7	45	97.5	195
	3	1	26	54	117	234	28.9	60	130	260
	4	1	39	81	175.5	351	43.3	90	195	390
	5	1	52	108	234	468	57.8	120	260	520
	6	1	58.5	121.5	263.3	526.5	65	135	292.5	585
	7	1	65	135	292.5	585	72.2	150	325	650
	8	1	78	162	351	702	86.7	180	390	780
	9	1	-	180	390	780	-	200	433.3	866.7
	MCS Index	Spatial streams	GI = 800 ns				GI = 400 ns			
			20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)	20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)
	0	2	13	27	58.5	117	14.4	30	65	130
	1	2	26	54	117	234	28.9	60	130	260
	2	2	39	81	175.5	351	43.3	90	195	390
	3	2	52	108	234	468	57.8	120	260	520
	4	2	78	162	351	702	86.7	180	390	780
	5	2	104	216	468	936	115.6	240	520	1040
	6	2	117	243	526.5	1053	130	270	585	1170
	7	2	130	270	585	1170	144.4	300	650	1300
	8	2	156	324	702	1404	173.3	360	780	1560
	9	2	-	360	780	1560	-	400	866.7	1733.4

Item	Specification									
	MCS Index	Spatial streams	GI = 800 ns				GI = 400 ns			
			20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)	20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)
	0	3	19.5	40.5	87.8	175.5	21.7	45	97.5	195
	1	3	39	81	175.5	351	43.3	90	195	390
	2	3	58.5	121.5	263.3	526.5	65	135	292.5	585
	3	3	78	162	351	702	86.7	180	390	780
	4	3	117	243	526.5	1053	130	270	585	1170
	5	3	156	324	702	1404	173.3	360	780	1560
	6	3	175.5	364.5	789.9	1579.5	195	405	877.5	1755
	7	3	195	405	877.5	1755	216.7	450	975	1950
	8	3	234	486	1053	2106	260	540	1170	2340
	9	3	260	540	1170	2340	288.9	600	1300	2600.1
	MCS Index	Spatial streams	GI = 800 ns				GI = 400 ns			
			20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)	20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)
	0	4	26	54	117	234	28.8	60	130	260
	1	4	52	108	234	468	57.8	120	260	520
	2	4	78	162	351	702	86.6	180	390	780
	3	4	104	216	468	936	115.6	240	520	1040
	4	4	156	324	702	1404	173.4	360	780	1560
	5	4	208	432	936	1872	231.2	480	1040	2080
	6	4	234	486	1053	2106	260	540	1170	2340
	7	4	260	540	1170	2340	288.8	600	1300	2600
	8	4	312	648	1404	2808	346.6	720	1560	3120
	9	4	-	720	1560	3120	-	800	1733	3466.8
	MCS Index	Spatial streams	GI = 800 ns	GI = 400 ns						

Item	Specification								
		20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)	20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)
0	8	52	108	234.4	468	57.6	120	260	520
1	8	104	216	468	936	115.2	240	520	1040
2	8	156	324	702.4	1404	173.6	360	780	1560
3	8	208	432	936	1872	231.2	480	1040	2080
4	8	312	648	1404	2808	346.4	720	1560	3120
5	8	416	864	1872	3744	462.4	960	2080	4160
6	8	468	972	2106.4	4212	520	1080	2340	4680
7	8	520	1080	2340	4680	577.6	1200	2600	5200
8	8	624	1296	2808	5616	693.6	1440	3120	6240
9	8		1440	3120	6240		1600	3466.4	6933.6

802.11ax data rates (20 MHz on both 2.4- and 5-GHz bands and 40, 80, and 160 MHz only on 5-GHz band):

MCS Index	Spatial streams	GI = 1600 ns				GI = 800 ns			
		20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)	20-MHz rate (Mbps)	40-MHz rate (Mbps)	80-MHz rate (Mbps)	160-MHz rate (Mbps)
0	1	4.3	8	17	34	4.3	9	18	36
1	1	16	33	68	136	17	34	72	144
2	1	24	49	102	204	26	52	108	216
3	1	33	65	136	272	34	69	144	282
4	1	49	98	204	408	52	103	216	432
5	1	65	130	272	544	69	138	288	576
6	1	73	146	306	613	77	155	324	649
7	1	81	163	340	681	86	172	360	721
8	1	98	195	408	817	103	207	432	865
9	1	108	217	453	907	115	229	480	961
10	1	122	244	510	1021	129	258	540	1081

Item	Specification								
	11	1	135	271	567	1134	143	287	600	1201
	0	2	8.6	16	34	68	8.6	18	36	72
	1	2	32	66	136	272	34	68	144	288
	2	2	48	98	204	408	52	104	216	432
	3	2	66	130	272	544	68	138	288	564
	4	2	98	196	408	816	104	206	432	864
	5	2	130	260	544	1088	138	276	576	1152
	6	2	146	292	612	1226	154	310	648	1298
	7	2	162	326	680	1362	172	344	720	1442
	8	2	196	390	816	1634	206	414	864	1730
	9	2	216	434	906	1814	230	458	960	1922
	10	2	244	488	1020	2042	258	516	1080	2162
	11	2	270	542	1134	2268	286	574	1200	2402
	0	3	12.9	24	51	102	12.9	27	54	108
	1	3	48	99	204	408	51	102	216	432
	2	3	72	147	306	612	78	156	324	648
	3	3	99	195	408	816	102	207	432	846
	4	3	147	294	612	1224	156	309	648	1296
	5	3	195	390	816	1632	207	414	864	1728
	6	3	219	438	918	1839	231	465	972	1947
	7	3	243	489	1020	2043	258	516	1080	2163
	8	3	294	585	1224	2451	309	621	1296	2595
	9	3	324	651	1359	2721	345	687	1440	2883
	10	3	366	732	1530	3063	387	774	1620	3243
	11	3	405	813	1701	3402	429	861	1800	3603
	0	4	17.2	32	68	136	17.2	36	72	144
	1	4	64	132	272	544	68	136	288	576

Item	Specification								
	2	4	96	196	408	816	104	208	432	864
	3	4	132	260	544	1088	136	276	576	1128
	4	4	196	392	816	1632	208	412	864	1728
	5	4	260	520	1088	2176	276	552	1152	2304
	6	4	292	584	1224	2452	308	620	1296	2596
	7	4	324	652	1360	2724	344	688	1440	2884
	8	4	392	780	1632	3268	412	828	1728	3460
	9	4	432	868	1812	3628	460	916	1920	3844
	10	4	488	976	2040	4084	516	1032	2160	4324
	11	4	540	1084	2268	4536	572	1148	2400	4804
	0	8	34	64	136	-	34	72	144	-
	1	8	128	264	544	-	136	272	576	-
	2	8	192	392	816	-	208	416	864	-
	3	8	264	520	1088	-	272	552	1152	-
	4	8	392	784	1632	-	416	824	1728	-
	5	8	520	1040	2176	-	552	1104	2304	-
	6	8	584	1168	2448	-	616	1240	2592	-
	7	8	648	1304	2720	-	688	1376	2880	-
	8	8	784	1560	3264	-	824	1656	3456	-
	9	8	864	1736	3624	-	920	1832	3840	-
	10	8	976	1952	4080	-	1032	2064	4320	-
	11	8	1080	2168	4536	-	1144	2296	4800	-

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	-89
802.11a/g					
6 Mbps	1	23	-95	23	-94
24 Mbps	1	22	-88	22	-87
54 Mbps	1	21	-79	20	-78
802.11n HT20					
MCS0	1	23	-95	23	-94
MCS4	1	22	-84	22	-84
MCS7	1	20	-77	20	-76
MCS8	2	23	-95	23	-94
MCS12	2	22	-83	22	-83
MCS15	2	20	-76	20	-75
MCS16	3	23	-94	23	-93
MCS20	3	22	-82	22	-82
MCS23	3	20	-75	20	-74
MCS24	4	23	-93	23	-92
MCS30	4	22	-81	22	-81
MCS31	4	20	-74	20	-73

Item	Specification				
802.11n HT40					
MCS0	1	23	-93	-	-
MCS4	1	22	-82	-	-
MCS7	1	20	-75	-	-
MCS8	2	23	-92	-	-
MCS12	2	22	-81	-	-
MCS15	2	20	-74	-	-
MCS16	3	23	-91	-	-
MCS20	3	22	-80	-	-
MCS23	3	20	-73	-	-
MCS24	4	23	-90	-	-
MCS30	4	22	-79	-	-
MCS31	4	20	-72	-	-
802.11ac VHT20					
MCS0	1	23	-95	-	-
MCS4	1	22	-86	-	-
MCS7	1	20	-79	-	-
MCS8	1	20	-75	-	-
MCS9	1	NA	NA	-	-
MCS0	2	23	-95	-	-
MCS4	2	22	-85	-	-
MCS7	2	20	-78	-	-
MCS8	2	20	-74	-	-
MCS9	2	NA	NA	-	-
MCS0	3	23	-95	-	-
MCS4	3	22	-84	-	-
MCS7	3	20	-77	-	-

Item		Specification			
MCS8	3	20	-73	-	-
MCS9	3	19	-72	-	-
MCS0	4	23	-94	-	-
MCS4	4	22	-83	-	-
MCS7	4	20	-76	-	-
MCS8	4	20	-72	-	-
MCS9	4	19	-71	-	-
802.11ac VHT40					
MCS0	1	23	-94	-	-
MCS4	1	22	-83	-	-
MCS7	1	20	-77	-	-
MCS8	1	19	-73	-	-
MCS9	1	19	-71	-	-
MCS0	2	23	-93	-	-
MCS4	2	22	-82	-	-
MCS7	2	20	-76	-	-
MCS8	2	19	-72	-	-
MCS9	2	19	-70	-	-
MCS0	3	23	-92	-	-
MCS4	3	22	-81	-	-
MCS7	3	20	-75	-	-
MCS8	3	19	-71	-	-
MCS9	3	19	-69	-	-
MCS0	4	23	-91	-	-
MCS4	4	22	-80	-	-
MCS7	4	20	-74	-	-
MCS8	4	19	-70	-	-

Item		Specification			
MCS9	4	19	-68	-	-
802.11ac VHT80					
MCS0	1	23	-91	-	-
MCS4	1	22	-80	-	-
MCS7	1	20	-73	-	-
MCS8	1	19	-69	-	-
MCS9	1	19	-67	-	-
MCS0	2	23	-90	-	-
MCS4	2	22	-79	-	-
MCS7	2	20	-72	-	-
MCS8	2	19	-68	-	-
MCS9	2	19	-66	-	-
MCS0	3	23	-89	-	-
MCS4	3	22	-78	-	-
MCS7	3	20	-71	-	-
MCS8	3	19	-67	-	-
MCS9	3	19	-65	-	-
MCS0	4	23	-88	-	-
MCS4	4	22	-77	-	-
MCS7	4	20	-70	-	-
MCS8	4	19	-66	-	-
MCS9	4	19	-64	-	-
802.11ac VHT160					
MCS0	1	23	-88	-	-
MCS4	1	21	-78	-	-
MCS7	1	19	-71	-	-
MCS8	1	18	-67	-	-

Item		Specification			
MCS9	1	18	-65	-	-
MCS0	2	23	-87	-	-
MCS4	2	21	-77	-	-
MCS7	2	19	-70	-	-
MCS8	2	18	-66	-	-
MCS9	2	18	-64	-	-
MCS0	3	23	-86	-	-
MCS4	3	21	-76	-	-
MCS7	3	19	-69	-	-
MCS8	3	18	-65	-	-
MCS9	3	18	-63	-	-
MCS0	4	23	-85	-	-
MCS4	4	21	-75	-	-
MCS7	4	19	-68	-	-
MCS8	4	18	-64	-	-
MCS9	4	18	-62	-	-
802.11ax HE20					
MCS0	1	23	-95	23	-94
MCS4	1	22	-86	22	-86
MCS7	1	20	-79	20	-79
MCS8	1	19	-76	19	-75
MCS9	1	19	-74	19	-73
MCS10	1	18	-71	17	-70
MCS11	1	18	-68	16	-67
MCS0	2	23	-95	23	-94
MCS4	2	22	-85	22	-85
MCS7	2	20	-78	20	-78

Item	Specification			
MCS8	2	19	-75	19	-74
MCS9	2	19	-73	19	-72
MCS10	2	18	-70	17	-69
MCS11	2	18	-67	16	-66
MCS0	3	23	-95	23	-94
MCS4	3	22	-84	22	-84
MCS7	3	20	-77	20	-77
MCS8	3	19	-74	19	-73
MCS9	3	19	-72	19	-71
MCS10	3	18	-69	17	-68
MCS11	3	18	-66	16	-65
MCS0	4	23	-94	23	-93
MCS4	4	22	-83	22	-83
MCS7	4	20	-76	20	-76
MCS8	4	19	-73	19	-72
MCS9	4	19	-71	19	-70
MCS10	4	18	-68	17	-67
MCS11	4	18	-65	16	-64
802.11ax HE40					
MCS0	1	23	-94		
MCS4	1	22	-84		
MCS7	1	20	-76		
MCS8	1	19	-73		
MCS9	1	19	-71		
MCS10	1	18	-68		
MCS11	1	18	-65		
MCS0	2	23	-93		

Item		Specification			
MCS4	2	22	-83		
MCS7	2	20	-75		
MCS8	2	19	-72		
MCS9	2	19	-70		
MCS10	2	18	-67		
MCS11	2	18	-64		
MCS0	3	23	-92		
MCS4	3	22	-82		
MCS7	3	20	-74		
MCS8	3	19	-71		
MCS9	3	19	-69		
MCS10	3	18	-66		
MCS11	3	18	-63		
MCS0	4	23	-91		
MCS4	4	22	-81		
MCS7	4	20	-73		
MCS8	4	19	-70		
MCS9	4	19	-68		
MCS10	4	18	-65		
MCS11	4	18	-62		
802.11ax HE80					
MCS0	1	23	-91	-	-
MCS4	1	22	-81	-	-
MCS7	1	20	-74	-	-
MCS8	1	19	-70	-	-
MCS9	1	18	-68	-	-
MCS10	1	17	-65	-	-

Item		Specification			
MCS11	1	17	-63	-	-
MCS0	2	23	-90	-	-
MCS4	2	22	-80	-	-
MCS7	2	20	-73	-	-
MCS8	2	19	-69	-	-
MCS9	2	18	-67	-	-
MCS10	2	17	-64	-	-
MCS11	2	17	-62	-	-
MCS0	3	23	-89	-	-
MCS4	3	22	-79	-	-
MCS7	3	20	-72	-	-
MCS8	3	19	-68	-	-
MCS9	3	18	-66	-	-
MCS10	3	17	-63	-	-
MCS11	3	17	-61	-	-
MCS0	4	23	-88	-	-
MCS4	4	22	-78	-	-
MCS7	4	20	-71	-	-
MCS8	4	19	-67	-	-
MCS9	4	18	-65	-	-
MCS10	4	17	-62	-	-
MCS11	4	17	-60	-	-
802.11ax HE160					
MCS0	1	23	-88	-	-
MCS4	1	22	-79	-	-
MCS7	1	18	-71	-	-
MCS8	1	18	-67	-	-

Item		Specification			
MCS9	1	17	-66	-	-
MCS10	1	16	-61	-	-
MCS11	1	16	-59	-	-
MCS0	2	23	-87	-	-
MCS4	2	22	-78	-	-
MCS7	2	18	-70	-	-
MCS8	2	18	-66	-	-
MCS9	2	17	-65	-	-
MCS10	2	16	-60	-	-
MCS11	2	16	-58	-	-
MCS0	3	23	-86	-	-
MCS4	3	22	-77	-	-
MCS7	3	18	-69	-	-
MCS8	3	18	-65	-	-
MCS9	3	17	-64	-	-
MCS10	3	16	-59	-	-
MCS11	3	16	-57	-	-
MCS0	4	23	-85	-	-
MCS4	4	22	-76	-	-
MCS7	4	18	-68	-	-
MCS8	4	18	-64	-	-
MCS9	4	17	-63	-	-
MCS10	4	16	-58	-	-
MCS11	4	16	-56	-	-

Cisco C9117AXI Antenna Patterns
2.4 GHz - Azimuth - Dual Band Antenna Elements
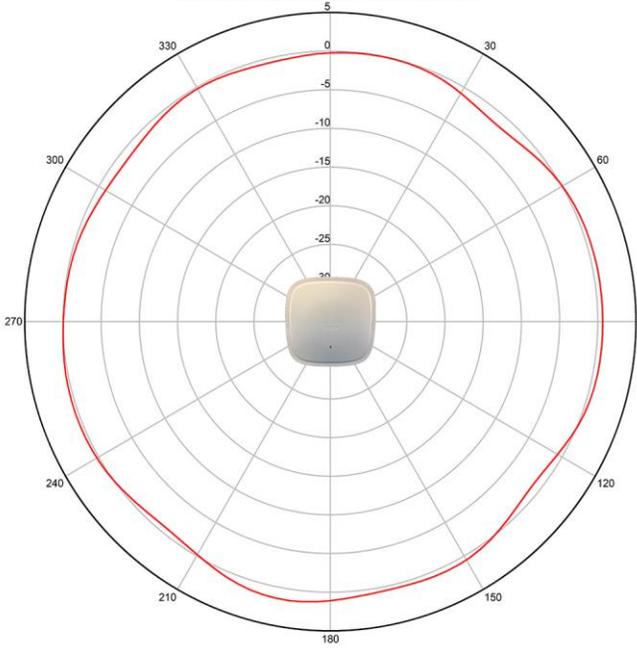
Cisco C9117AXI Antenna Patterns
2.4 GHz - Elevation - Dual Band Antenna Elements
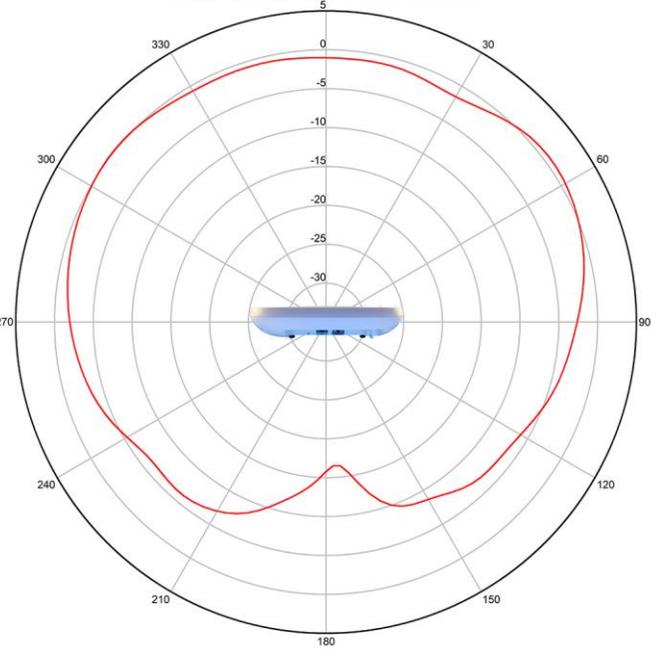
Cisco C9117AXI Antenna Patterns
5 GHz - Azimuth - Dual Band Antenna Elements
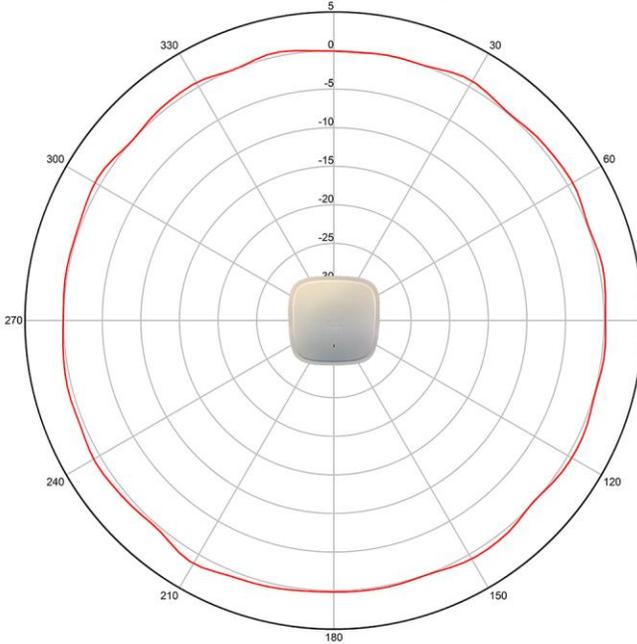
Cisco C9117AXI Antenna Patterns
5 GHz - Elevation - Dual Band Antenna Elements
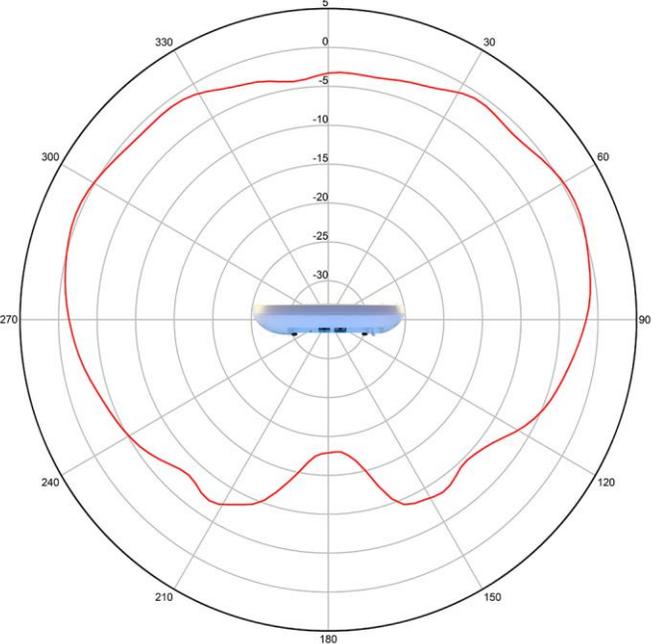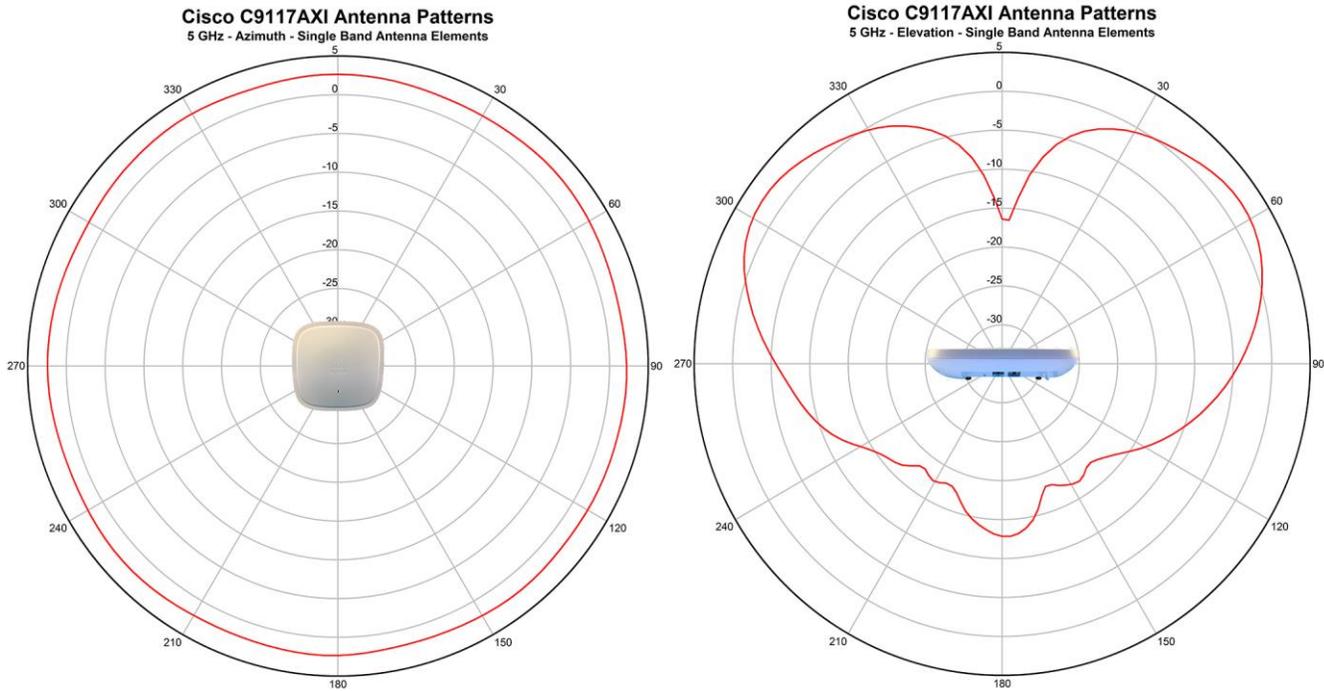
Figure 1.
Antenna Radiation Patterns for C9117AXI

Licensing and software packaging

The Cisco Catalyst 9100 Series requires mandatory Smart Licensing. This provides ease of use for Cisco DNA license management, consumption, and tracking. The Cisco Catalyst 9100 Series uses packaging that includes vastly simplified base network packages (Network Essentials and Network Advantage) and term-based software packages (Cisco DNA Essentials, Cisco DNA Advantage) as add-ons. The Cisco DNA packages, in addition to on-box capabilities, also unlock additional functionality in Cisco DNA Center, enabling controller-based software-defined automation and assurance in your network.

The Cisco Catalyst 9100 Series can support 3 types of Cisco DNA license: Cisco DNA Essentials, Cisco DNA Advantage and Cisco DNA Premier. The Cisco DNA licenses provide Cisco innovations on the AP. The Cisco DNA license also includes the Network Essentials and Network Advantage licensing options which cover wireless fundamentals such as 802.1x authentication, QoS, PnP etc, telemetry and visibility, SSO, as well as security controls. These Network essentials and Network advantage components are perpetual and is valid till the life of the AP. Cisco DNA subscription licenses have to be purchased for a 3-, 5-, or 7-year subscription term. However, upon expiry of Cisco DNA license, Cisco DNA features will expire, whereas network essentials and network advantage features will remain.

Note that it is not required to deploy Cisco DNA Center just to use one of the above packages. Refer to https://www.cisco.com/c/dam/en/us/products/collateral/software/one-wireless-subscription/q-and-a-c67-739601.pdf for additional details about the Essentials and Advantage packages.

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

Managing Licenses with Smart Accounts

Creating Smart Accounts by using the Cisco Smart Software Manager (CSSM) enables you to order devices and licensing packages and also manage your software licenses from a centralized website. You can set up the Smart Account to

receive daily email alerts and to be notified of expiring add-on licenses that you want to renew. A Smart Account is mandatory for Catalyst 9100 access points. For more information on Smart Account refer to https://www.cisco.com/go/smartaccounts.

Warranty information

The Cisco Catalyst 9117 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 about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

Cisco Services

With Cisco Services, you can achieve infrastructure excellence faster with less risk. From initial WLAN readiness assessment to implementation, full solution support and in-depth training, our services for the Cisco Catalyst 9117 Access Points 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

Flexible payment solutions to help you achieve your objectives

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.