WLAN Series 2332 Access Point Installation Guide

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Regulatory Compliance Statements for WLAN Series 2332 Access Points

The WLAN Series 2332 Access Points consist of the following models:

2332-A1, 2332-A2, 2332-A3, 2332-A4, 2332-A5, 2332-A6, 2332-E1, 2332-E2, 2332-E3, 2332-E4, 2332-E5, 2332-E6, 2332-E7, 2332-E8, 2332-E9, 2332-J1.

Federal Communications Commission (FCC) Compliance Notices

This section includes the following FCC statements for the WLAN 2332-A1 and related Series 2332 access points:

- FCC ID: RVW2332 (Applies to 2332-A1)
- Class B Interference Statement
- RF Radiation Exposure & Hazard Warning
- Non-Modification Statement
- Deployment Statement

Class B Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Radiation Exposure & Hazard Statement

To ensure compliance with FCC RF exposure requirements, this device must be installed in a location such that the antenna of the device will be greater than 20 cm (8 in.) away from all persons. Using higher gain antennas and types of antennas not covered under the FCC certification of this product is not allowed. Installers of the radio and end users of the product must adhere to the installation instructions provided in this manual.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Non-Modification Statement

Use only the supplied internal antenna, or external antennas supplied by the manufacturer. Unauthorized antennas, modifications, or attachments could damage the WLAN 2332-A1 and related Series 2332 access points and violate FCC regulations. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. Contact Avaya for a list of approved 2.4 GHz and 5.0 GHz external antennas.

This device must be operated with the CAT-5 Ethernet cable installed on each activated Ethernet Port of a Series 2332 access point to ensure compliance with the Class B emissions standards. Failure to comply with this installation requirement may cause the device to operate in excess of the allowable emissions limits.

Deployment Statement

This product is certified for indoor deployment only. **Do not** install or use this product outdoors.

Dynamic Frequency Selection (DFS) in the 5.0 GHz UNII bands

The 2332-A1 access point has been prohibited, via software, from operating in the 5250 to 5350 MHz and 5470 to 5725 MHz frequency bands for the US and Canada because it cannot meet the DFS requirements as outlined in the rules of the FCC for Part 15, Subpart E that come into force on July 20, 2007.

Canadian IC Statement

IC: 332R-2332 (Applies to 2332-A1).

Operation is subject to the following two conditions in Canada:

1) this device may not cause interference, and

2) this device must accept any interference, including interference that may cause undesired operation of the device

To prevent radio interference to the licensed service (i.e. co-channel Mobile Satellite systems) this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing and not supported by the WLAN Access Point 2332-A1.

Because high power radars are allocated as primary users (meaning they have priority) in the 5250 to 5350 MHz band, these radars could cause interference and/or damage to license exempt WLAN devices.

European Union and European Free Trade Association (EFTA) Regulatory Compliance

This equipment may be operated in the countries that comprise the member countries of the European Union and the European Free Trade Association. These countries, listed in the following paragraph, are referred to as The European Community throughout this document:

AUSTRIA, BELGIUM, BULGARIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, NETHERLANDS, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, UNITED KINGDOM, ICELAND, LICHTENSTEIN, NORWAY, SWITZERLAND

The WLAN Access Point 2332-E1 and related Series 2332 access points communicate with an Avaya WLAN - Security Switch using a standard CAT-5 (Category 5) or higher 10/100 Mbps twisted pair Ethernet cable to provide wireless local area networking (WLAN) capabilities. The WLAN Access Point 2332-E1 and related Series 2332

Access Points include one 802.11a and one 802.11b/g radio and two 802.11a and two 802.11b/g omnidirectional internal antennas. In addition, the 2332-E1 and related Series 2332 access points can use optional factory-supplied external omnidirectional and/or directional high-gain antennas, one per the 802.11b/g and one per the 802.11a radios, as described in the external antenna section of the WLAN Series 2332 Access Point Installation Guide. When using the external antennas, connect them to the reverse-polarity R-SMA connectors located on the side of the WLAN Access Point 2332-E1 or related Series 2332 Access Point.

Declaration of Conformity

Marking by this symbol 

indicates compliance with the Essential Requirements of the R&TTE Directive of the European Union (1999/5/EC). This equipment meets the following conformance standards:

Safety: EN 60950-1:2001 + A11:2004

EMC: EN 55022:2006, EN 55024:1998 + A1:2001 + A2:2003, EN 301-489-1 v1.6.1, EN 301-489-17 v1.2.1, CISPR22:1997, CISPR24

Including: EN 61000-3-2, -3-3, -4-2, -4-3, -4-4, -4-5, -4-6 and -4-11. The product is also licensed as required for additional country specific standards as required for the International Marketplace.

Radio: EN 300-328 v.1.7.1 (2006-10) & EN 301-893 v.1.4.1 (2007-07)

DEVIATION: The 2332-E1 and related Series 2332 access points were tested to and are compliant with all of the technical specifications of EN 301-893 v1.4.1 for operation in the 5.0 GHz bands, **except** the DFS requirements in the 5600 – 5650 MHz band.

IEEE 802.11a operation in the 5250 to 5350 MHz and 5470 to 5725 MHz frequency bands is governed by ETSI EN 301-893 v1.4.1 and the R&TTE Directive 1999/5/EC. Effective July 1, 2008, EN 301-893 v1.4.1 was updated to require compliance with 0.8 µsecond pulse widths and staggered PRF's in the 5470 – 5725 MHz band. The 2332-E1 access point meets compliance with these new mandates by disabling operation, via software, on channels 120, 124, 128 and 132 in the 5600 to 5650 MHz frequency band because it cannot meet the 0.8 µsecond pulse width and staggered PRF DFS requirements as outlined in the updated EN 301-893v1.4.1 standard.

Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques and Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN. Certifications are harmonized to the EN standards covering essential requirements under article 3.2 of the R&TTE Directive. Compliance includes testing with antennas as specified in attached table.

SAR: EN 50385:2002

European Community Declaration of Conformity

WLAN Radio Model 2332, as stated in the following Declarations of Conformity, represents all models in the Series 2332 as listed above.

Bulgaria	български С това, avaya обявява, че този модел на радио на WLAN Радио Модел 2332, е със съгласие с съществените изисквания и други важни условия на директива 1999/5 на европейски съюз
Czech Republic	Èesky Avayatímto prohlašuje, že tento WLAN Rádio Model 2332, je ve shodì se základními požadavky a dalšími pøíslušnými ustanoveními smìrnice 1999/5/ES.
Denmark	Dansk Undertegnede Avayaerklærer herved, at følgende udstyr WLAN Radio Model 2332, overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
English	English Hereby, Avaya declares that this WLAN Radio Model 2332, is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Estonia	Eesti Käesolevaga kinnitab Avayaseadme WLAN Radio Model 2332, vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
Finland	Suomi Avayavakuuttaa täten että WLAN Radio Esikuvallinen 2332, tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
France	Français Par la présente Avaya déclare que l'appareil Model Par radio 2332 de WLAN, est conforme aux exigencies essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Germany	Deutsch Hiermit erklärt Avaya., dass sich das Gerät WLAN Radiomodell 2332, in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.

Greece	ΕΛΛΗΝΙΚΗ ÌÅ ÔÇÍ ÐÁÑÏÕÓÁ Avaya. ÇË.ÍÅÉ ÏÔÉ WLAN ραδιο πρότυπο 2332, ÓÕÌÌÏÑÖ.ÍÅÔÁÉ ÐÑÏÓ ÔÉÓ ÏÕÓÉ..ÅÉÓ ÁÐÁÉÔÇÓÅÉÓ ÊÁÉ ÔÉÓ ËÏÉÐÅÓ Ó×ÅÔÉÊÅÓ .ÉÁÔÁÎÅÉÓ ÔÇÓ Ï.ÇÃÉÁÓ 1999/5/ÅÊ.
Hungary	Magyar Alulírott, Avayanyilatkozom, hogy a WLAN Rádió Minta 2332, megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Italy	Italiano Con la presente Avayadichiara che questo Modello Radiofonico 2332 di WLAN, è conforme ai requisiti essenziali ed alle alter disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latvia	Latviski Ar šo Avayadeklarç, ka WLAN Radio Model 2332, atbilst Direktîvas 1999/5/EK bûtiskajâm prasîbâm un citiem ar to saistîtajiem noteikumiem.
Lithuania	Lietuviø Šiuo Avayadeklaruoja, kad šis WLAN Radio Model 2332, atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Malta	Malti Hawnhekk, Avaya., jiddikjara li dan WLAN Radio Model 2332, jikkonforma mal-tiijiet essenzjali u ma provvedimenti orajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Netherlands	Netherlands Hierbij verklaart Avayadat het toestel WLAN Radiomodel 2332, in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Poland	Polski Niniejszym Avayaooewiadcza, ¿e WLAN Radio Model 2332, jest zgodny z zasadniczymi wymogami oraz pozosta³ymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
Portugal	Português Avayadeclara que este Modelo De rádio 2332 de WLAN, está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Romania	Român Astfel, Avaya declarã acel acest WLAN Radio Model 2332, este în conformitate cu cerinþele necesare ºi proviziile alte semnificative de Directive 1999 5 EC.

Slovakia	Slovensky Avayatýmto vyhlasuje, že WLAN Radio Model 2332 spåòa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Slovenia	Slovensko Avayaizjavlja, da je ta WLAN Radio Model 2332, v skladu z bistvenimi zahtevami in ostalimi relevantnimi doloèili directive 1999/5/ES.
Spain	Español Por medio de la presente Avayadeclara que el Modelo De radio 2332 de WLAN, cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Sweden	Svenska Härmed intygar Avayaatt denna WLAN Radiotelegrafera till Modell 2332, står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Countries of Operation & Restrictions of Use in the European Community

Operation Using the 2.400 to 2.4835 GHz Channels in the European Community

The professional installer should use the configuration utility provided with this product to verify the current channel of operation, the expected transmit power level, and to confirm that the device is operating in conformance with the spectrum usage rules for the selected European Community country. **If operation is occurring outside of the allowable channels as indicated in this guide, then operation of the product must cease immediately** and the installer must consult with the local technical support staff responsible for the wireless network.

This device is intended to be operated in all countries of the European Community. Additional restrictions of use for the 2332-E1 and related Series 2332 access points within the European Community countries in the 2.400 to 2.4835 GHz band are listed below.

- The frequencies associated with channels 1 to 13 in the 2.400 to 2.4835 GHz band are allowed to be used either indoors or outdoors in all countries of the European Community, except where noted below:
- In **Italy** and **Latvia** the end-user must apply for a license from the national spectrum authority to operate this device outdoors. Please consult the Avaya WLAN 2300 Series Outdoor Solutions Guide for further information regarding restrictions and operating conditions for outdoor configurations.
- In **France**, the following operation is permitted:
    - Outdoor operation is **only** permitted using the 2.400 - 2.454 GHz band, which includes channels 1 to 7, at a maximum EIRP of 100 mW (20 dBm).
    - Outdoor operation is permitted in the 2.400 to 2.4835 GHz band on channels 1 to 13 at a maximum EIRP of 10 mW (10 dBm).
    - Indoor operation is permitted in the 2.400 to 2.4835 GHz band on channels 1 to 13 at a maximum EIRP of 100 mW (20 dBm).

    The 2332-E1 and related Series 2332 access points, whether using the internal or approved external antennas, are guaranteed to meet this limit by automatically adjusting the transmit power level through the operating software depending upon the gain of the selected antenna.

Operation Using the 5.15 to 5.25 GHz, 5.25 to 5.35 GHz, and 5.470 to 5.725 GHz Channels in the European Community

To remain in conformance with European National spectrum usage laws, follow the channel limitations associated with the 5 GHz bands as specified in this document. The professional installer should verify the current channel of operation and the expected transmit power level of the WLAN Access Point 2332-E1 or related Series 2332 access point to confirm that the device is operating in conformance with the spectrum usage rules for the European Community country where the unit is being installed. **If operation is occurring outside of the allowable frequencies or above the power levels, as indicated in this guide, then operation of the product must cease immediately** and the installer must consult with the local technical support staff responsible for the wireless network.

This device is intended to be operated in all countries of the European Community. Additional restrictions of use for the 2332-E1 and related Series 2332 access points within the European Community countries in the 5.15 to 5.25 GHz, 5.25 to 5.35 GHz, and 5.470 to 5.725 GHz bands are listed below.

- This device is restricted to **indoor** use only when operated in the European Community using the 5.15-5.25 GHz and 5.25-5.35 GHz bands, which includes channels 36, 40, 44, 48, 52, 56, 60 & 64.
- The **5 GHz Turbo Mode** feature is not allowed for operation in any European Community country.
- In **Italy** the end-user must apply for a license from the national spectrum authority to operate this device outdoors. Please consult the Avaya WLAN 2300 Series Outdoor Solutions Guide for further information regarding restrictions and operating conditions for outdoor configurations.

Dynamic Frequency Selection (DFS)

The 2332-E1 and related Series 2332 access points implement a DFS feature in accordance with the limits in EN 301-893v1.4.1, Section 4.7 and Annex D, Tables D.1, D.2 & D.4 for a device operating in the mode defined as “Master”. Section 4.7 and Table 5 of this document define the requirements prior to using a channel and during normal operation for a Master device (i.e., Interference Detection Threshold, Channel Availability Check Time, Uniform Spreading, Channel Closing Transmission Time and Channel Move Time). This product qualifies for this category since the maximum achievable transmit power is greater than 23 dBm per the requirements of Table D.2 in Annex D of the standard.

IEEE 802.11a operation in the 5250 to 5350 MHz and 5470 to 5725 MHz frequency bands is governed by ETSI EN 301-893v1.4.1 and the R&TTE Directive 1999/5/EC. Effective July 1, 2008, EN 301-893 v1.4.1 was updated to require compliance with 0.8 µsecond pulse widths and staggered PRF’s in the 5470 – 5725 MHz band. The 2332-E1 access point meets compliance with these new mandates by disabling operation, via software, on channels 120, 124, 128 and 132 in the 5600 to 5650 MHz frequency band because it cannot meet the 0.8 µsecond pulse width and staggered PRF DFS requirements as outlined in the updated EN 301-893v1.4.1 standard.

Transmit Power Control (TPC)

European Regulatory requirements specify that wireless devices must employ Transmit Power Control (TPC) to reduce the potential for interference to other communication systems operating in the 5 GHz frequency bands. This device includes a provision for adjustment of Transmit Power in accordance with the limits in EN 301-893v1.4.1, Sections 4.4.2.1 and 4.4.2.2.

Korea MIC Compliance Statement

당해 무선설비는 운영 중 전파혼신 가능성이 있음

Possible radio wave interference during operation of concerned radio equipment.

B. For Home Use (Class B device)

B 급 기기 (가정용 정보통신기기)

이 기기는 가정용으로 전자파 적합 등록을 받은 기기로서,
주거 지역에서는 물론 모든 지역에서 사용할 수 있습니다.

This product obtained EMC Registration for home use. It can be used in all areas, including homes.

Taiwan Compliance Statement

802.11b/802.11g/BT 警語 :

第十二條→經型式認證合格之低功率射頻電機，非經許可，公司，商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條→低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。 低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Article 12

Without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to an approved low power radio-frequency device.

Article 14

The low power radio-frequency devices shall not influence aircraft security and interfere with legal communications. If found, the user shall cease operating immediately until no interference is achieved.

The said legal communications means radio communications is operated in compliance with the Telecommunications Act.

The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.

LP002

802.11a 警語 ：

4.7→無線傳輸設備(UNII)

4.7.5→在 5.25-5.35 秭赫頻炙內操作之無線資訊傳輸設備，限於室內使用。

4.7.6→無線資訊傳輸設備忍受合法通信之干擾且不得干擾合法通信；如造成干擾，應立即停用，俟無干擾之虞，始得繼續使用。

4.7.7→無線資訊傳設備的製造廠商應確保頻率穩定性，如依製造廠商使用手冊上所述正常操作，發射的信號應維持於操作頻帶中。

加印警語→「避免電波干擾，本器材禁止於室外使用 5.25-5.35 姊赫頻帶」於器材使用說明書內，並將警語印製貼紙可黏貼於裝設器材機身外明處。

4.7.5 Within the 5.25-5.35 GHz band, U-NII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations.

4.7.6 The operation of the U-NII devices is subject to the conditions that no harmful interference is caused. The user must stop operating the device immediately should harmful interference be caused and shall not resume until the condition causing the harmful interference has been corrected.

Moreover, the interference must be accepted that may be caused by the operation of an authorized communications, or ISM equipment.

4.7.7 Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.

Brazilian Compliance Statement

"Este equipamento opera em caráter secundário, isto é, não tem direito à proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário."

External Antenna Statement

Intentional radiators, such as the Avaya WLAN Series 2332 Access Point, are not intended to be operated with any antenna(s) other than those furnished by Avaya. An intentional radiator may only be operated with the antenna(s) with which it is authorized. For a complete listing of the authorized antennas for use with this product, visit http://www.avaya.com/support.

In order to ensure continued compliance, use of an antenna not on the Avaya approved antenna list is not allowed without specific authorization from Avaya.

Use of an antenna not specifically authorized by Avaya may not comply with local regulatory requirements with respect to radiated emission limits and may result in illegal operation of the product. The installer of the wireless system and associated antenna is required to ensure that only those antennas on the Avaya approved antenna list or those antennas specifically approved by Avaya on a case by case basis are deployed with the intentional radiator.

Be sure to associate the appropriate antenna model number and localized regulatory region when selecting the Avaya authorized antenna(s).

Country Specific External Antenna Restrictions

The following list of countries cannot use the Avaya approved antennas listed in the table. Use of these antennas would violate the local regulatory rules and approved certifications for that country or operation is not allowed in the specified frequency bands.

Country	2.4 GHz	5.0 GHz
Costa Rica		ALL antenna models
Indonesia		ALL antenna models
Japan		S51514WPN36RSM
		S4901790PN36RS
		SR49120DAN36RS
	SR24120DN36RSM	
Korea	S2406PN36RSM	S51514WPN36RSM
	S2409PN36RSM	S4901790PN36RS
	PC2415NA36RSM	SR49120DAN36RS
	S241290PN36RSM	
	SR24120DN36RSM	
Nigeria		ALL antenna models
Russian Federation		ALL antenna models
Thailand		ALL antenna models

WiFi Certification

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Ongoing product training is available. For more information or to register, you can access the Web site at www.avaya.com/support. From this Web site, you can locate the Training contacts link on the left-hand navigation pane.

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Getting technical support from the Avaya Web site

The easiest and most effective way to get technical support for Avaya products is from the Avaya Technical Support Web site at www.avaya.com/support.

Introducing the Avaya WLAN 2300 System

This guide shows you how to install an Avaya Access Point (AP) in an Avaya WLAN 2300 System.

Read this guide if you are a network administrator or other person installing an AP in a network.

Note. For a complete listing of the access point models in the WLAN Series 2332 and their respective countries of operation, please visit: http://www.avaya.com/support.
All models of the 2332 access point have been region-locked to meet geographic regulatory restrictions. Each model is associated to a specific regulatory domain and subsequent country of operation. During installation, the access point model and wireless security switch regulatory domain must match or the access point will not operate.

Avaya WLAN 2332 Series System

The Avaya WLAN 2300 System is an enterprise-class WLAN solution that seamlessly integrates with an existing wired enterprise network. The Avaya system provides secure connectivity to both wireless and wired users in large environments such as office buildings, hospitals, and university campuses.

The Avaya WLAN 2300 System fulfills the three fundamental requirements of an enterprise WLAN: It eliminates the distinction between wired and wireless networks, allows users to work safely from anywhere (*secure mobility*), and provides a comprehensive suite of intuitive tools for planning and managing the network before and after deployment, greatly easing the operational burden on IT resources.

The Avaya WLAN 2300 System consists of the following components:

- **WLAN Management Software tool suite**—A full-featured graphical user interface (GUI) client application used to plan, configure, and deploy a WLAN and manage the users. It also provides a centralized service application for the WLAN to allow for user monitoring, reporting, and diagnostics
- **One or more WLAN—Security Switches (WSSs)** —Distributed, intelligent machines for managing user connectivity, connecting and powering Access Points (APs), and connecting the WLAN to the wired network backbone
- **Multiple Access Point (AP)** —Wireless access points that transmit and receive radio frequency (RF) signals to and from wireless users and connect them to a WSS
- **WLAN 2300 System Software (WSS Software)**—The operating system that controls all WSSs and APs in a WLAN. It is accessible through a command-line interface (CLI), or the WLAN Management Software GUI

Documentation

Consult the following documents to plan, install, configure, and manage an Avaya WLAN 2300 System.

Planning, configuration, and deployment

- *Avaya WLAN Management Software 2300 Series User Guide*: This document provides instructions for planning, configuring, deploying, and managing the entire WLAN with the WLAN Management Software tool suite. Read this guide to learn how to plan wireless services, how to configure and deploy Avaya equipment to provide those services, and how to optimize and manage your WLAN.
- *Avaya WLAN Management Software 2300 Series Reference Guide*: Detailed instructions and information for all WLAN Management Software planning, configuration, and management features.

Installation

- *Avaya WLAN Security Switch 2300 Series Quick Start Guide:* Instructions for performing basic setup of secure (802.1X) and guest (Web AAA) access, for configuring a Mobility Domain for roaming, and for accessing a sample network plan in the WLAN Management Software for advanced configuration and management
- *Avaya WLAN—Security Switch 2300 Series Installation and Basic Configuration Guide*: Instructions and specifications for installing a WSS in an Avaya WLAN 2300 System, and basic instructions for deploying a secure IEEE 802.11 wireless service
- *Avaya WLAN—Series 2332 Access Point Installation Guide*: Instructions and specifications for installing an AP and connecting it to a WSS

Configuration and management

- *Avaya WLAN Management System 2300 Series Reference Guide*: Instructions for planning, configuring, deploying, and managing the entire WLAN with the WLAN Management Software tool suite
- *Avaya WLAN—Security Switch 2300 Series Configuration Guide*: Instructions for configuring and managing the system through the WSS Software CLI
- *Avaya WLAN—Security Switch 2300 Series Command Line Reference:* Functional and alphabetical reference to all WSS Software commands supported on WSSs and APs

Safety and advisory notices

The following kinds of safety and advisory notices appear in this manual. (For translations of the warning conventions and of all warnings in this manual, see Appendix , “Translated caution statement, warning conventions and warning messages,” on page 133.)

Caution! This situation or condition can lead to data loss or damage to the product or other property.

Warning! This situation or condition can cause injury.

Warning! High voltage. This situation or condition can cause injury due to electric shock.

Note. This information is of special interest.

Text and syntax conventions

Avaya manuals use the following text and syntax conventions:

Convention	Use
Monospace text	Sets off command syntax or sample commands and system responses.
Bold text	Highlights commands that you enter or items you select.
Italic text	Designates command variables that you replace with appropriate values, or highlights publication titles or words requiring special emphasis.
Menu Name > **Command**	Indicates a menu item that you select. For example, **File** > **New** indicates that you select **New** from the File menu.
[ ] (square brackets)	Enclose optional parameters in command syntax.
{ } (curly brackets)	Enclose mandatory parameters in command syntax.
| (vertical bar)	Separates mutually exclusive options in command syntax.

AP overview

An Avaya Access Point (AP) provides IEEE 802.11 wireless access to the network. APs are designed for use with an Avaya WLAN—Security Switch (WSS). APs require hardware installation only. All configuration for an AP takes place on the WSS.

The WLAN Series 2332 Access Point communicates with an Avaya WLAN - Security Switch using a standard CAT-5 (Category 5) or higher 10/100 Mbps twisted pair Ethernet cable to provide wireless local area networking capabilities. The WLAN Series 2332 Access Point includes one 802.11a and one 802.11b/g radio and two 802.11a and two 802.11b/g omnidirectional internal antennas. In addition, the access points can use optional factory-supplied external omnidirectional and/or directional high-gain antennas, one per the 802.11b/g and one per the 802.11a radios, as described in the external antenna section of this document.

When using the external antennas, connect them to the reverse-polarity R-SMA connectors located on the side of the WLAN Access Point Series 2332 model.

Warning! Installation must be performed by qualified service personnel only. Read and follow all warning notices and instructions marked on the product or included in the documentation. (For translations of this warning, see "Qualified service personnel warning" on page 135.)

External hardware features

Figure 1 and Figure 2 show the external hardware features of the Series 2332 access point.

Figure 1. AP Model —Top View

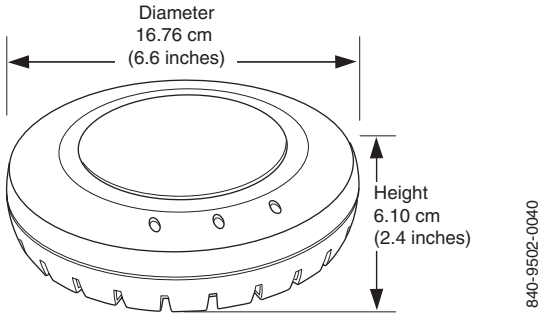
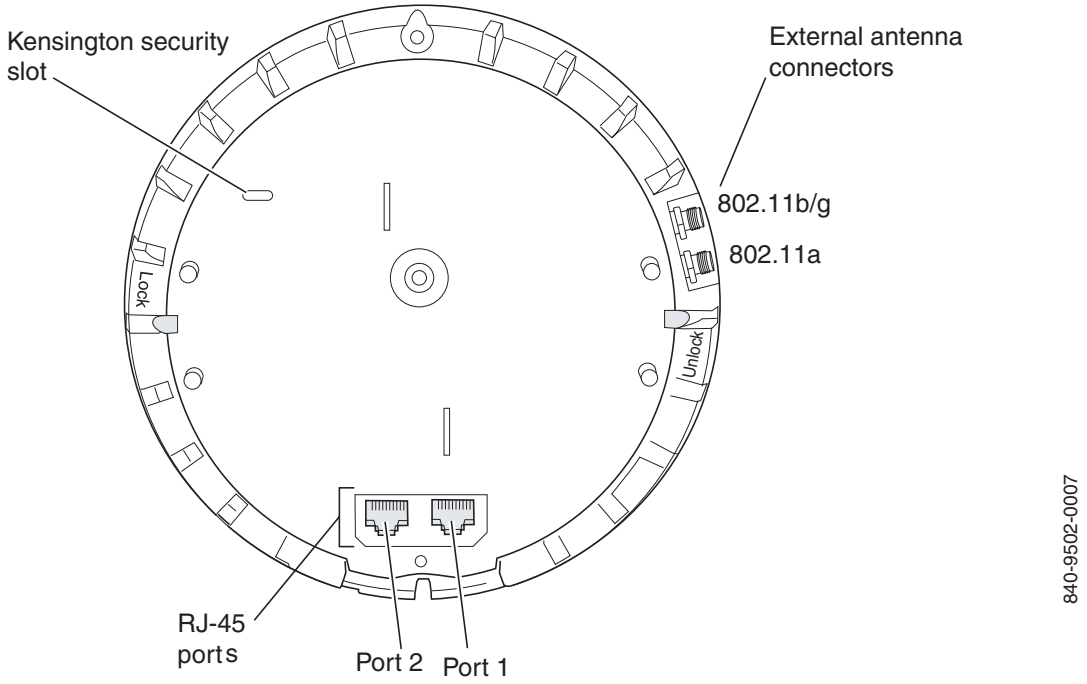


Figure 2. AP Model Series 2332 —Bottom View



Cable ports

The Series 2332 access point has two RJ-45 ports. (Figure 2 on page 24.) Each port provides a 10/100BASE-TX Ethernet connection to an WSS. The connection can be direct to an WSS or indirect through an intermediate Layer 2 or Layer 3 network.

The AP receives power and data through the RJ-45 ports. Use a Category 5 (Cat 5) cable with straight-through signaling and standard RJ-45 connectors to connect an AP to an WSS or other device in the network. The Series 2332 access point supports 802.3af, and also can receive PoE from Avaya switches and Avaya-approved power injectors.

The two RJ-45 ports support dual-homed configurations for redundancy. An AP uses only one link for booting, configuration, and data transfer. If the link becomes unavailable, the AP can reboot using the other link. The ports are identical except for logical numbering (1 or 2). You can use either port to connect an AP to an WSS. However, an AP always attempts to boot on AP port 1 first. Only if the boot attempt on port 1 fails does the AP attempt to boot on port 2. If one port become s unavailable, the other port can provide full power to the AP.

The Series 2332 access point must be operated with a CAT-5 Ethernet cable installed on each activated Ethernet Port to ensure compliance with the Class B emissions standards. Failure to comply with this installation requirement may cause the device to operate in excess of the allowable emissions limits.

Warning! APs do not support daisy-chain configurations. Do not connect one Series 2332 access point to any other access point through the second RJ-45 port.

Kensington security slot

The WLAN Series 2332 access points have a slot to attach a Kensington security cable. The cable is not included with the Series 2332 access point.

AP mounting options

You can mount an access point on any of the following types of surfaces:

- Suspended T-bar ceiling
- Junction box
- Solid surface wall or ceiling

Note. The solid surface mounting option requires Cat-5 cable that does not have strain relief. The other mounting options can use Cat-5 cable with or without strain relief.

Status LEDs

The AP has LEDs that provide status information of the device. Figure 3 shows the locations of the LEDs. Table 1 describes the LEDs.

Figure 3. Health and Radio LEDs—Series 2332 access point

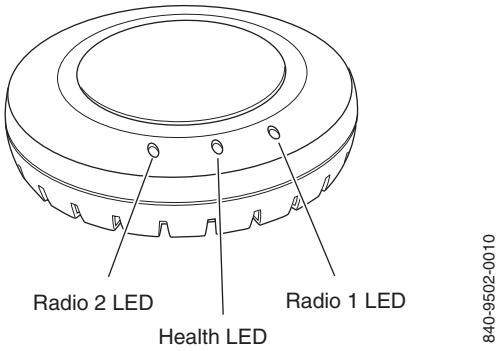


Table 1. Access Point LEDs—Series 2332 access point

LED	Appearance	Meaning
Health	Solid green	All the following are true: • Management link with a WSS is operational. • AP has booted. • AP has received a valid configuration from a WSS. • At least one radio is enabled or is in sentry mode.
	Solid amber	AP is waiting to receive boot instructions and a configuration file from a WSS.
	Alternating green and amber	AP is booting and receiving its configuration file from a WSS.

Table 1. Access Point LEDs—Series 2332 access point (continued)

LED	Appearance	Meaning
Radio 1 Radio 2	Solid green	A client is associated with the radio.
	Blinking green	Associated client is sending or receiving traffic.
	Blinking amber	Non-associated client is sending or receiving traffic.
	Alternating green and amber	Radio is unable to transmit. This state can occur due to any of the following: • Excessive radio interference in the environment is preventing the radio from sending beacons. • The radio has failed.
	Unlit	Means one of the following: • Radio is disabled. • Radio is enabled, but no clients are associated with the radio and there is no traffic activity.

Installing and connecting a Series 2332 Access Point

Note. Before installing an AP, you might need to generate a network plan and an AP work order with WLAN Management Software . (See “WLAN Management software network plan and work orders” on page 32.)

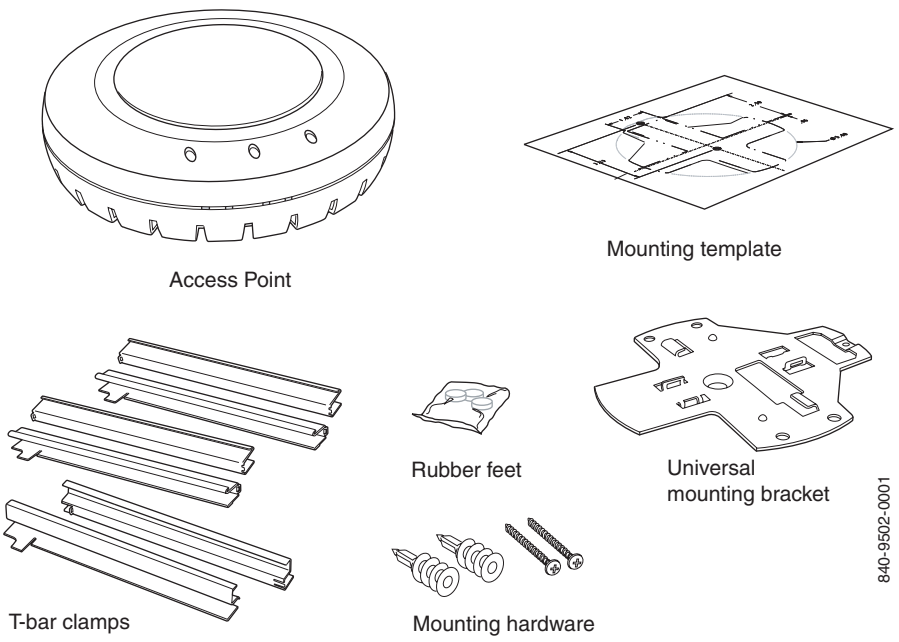
Unpacking an AP

The shipping carton for an AP contains the following items:

- One AP
- Mounting kit:
  - One universal mounting bracket (attached to the AP)
  - One paper mounting template (used for marking the cutting areas and screw hole locations)
  - One two-piece 14.2-mm (9/16-inch) T-bar clamp
  - One two-piece 15.9-mm (5/8-inch) T-bar clamp
  - One two-piece 23.9-mm (15/16-inch) T-bar clamp
  - Two #6 sheet metal screws and two drywall anchors
  - Three adhesive rubber feet
- One documentation pack that includes the following documents:
  - Avaya WLAN Series 2332 Access Point Quick Installation Guide
  - Avaya WLAN 2300 Series Access Point Mounting Template
  - Avaya WLAN 2300 Series Outdoor Solution Guide

Figure 4 shows the contents of the shipping carton for a model Series 2332 access point.

Figure 4. 2332 Series Shipping Carton Contents



Before you begin installation:

1. Open the carton and carefully remove the contents, if you have not already done so.
2. Place the packing materials back in the carton and save the carton.
3. Verify that you received each item in the previous list. If any item is missing or damaged, contact Avaya.

Installation requirements and recommendations

For best results, follow these requirements and recommendations before installing an AP.

WLAN Management software network plan and work orders

If you are using the WLAN Management Software to plan your Avaya Mobility System installation, you might want to create and verify a network plan for the entire Avaya network installation and generate an AP work order, before installing any access points. A network plan and the AP work orders provide the following information about AP installation and configuration:

- Number of APs required for adequate WLAN capacity in each coverage area
- Detailed installation location for each AP
- Settings for all APs in the WLAN

(For information about installing WLAN Management Software , creating and verifying a network plan, and generating an AP work order, see the *Avaya WLAN Management Software 2300 Series User Guide* and *Avaya WLAN Management Software 2300 Series Reference Guide*.)

WSS recommendation

Avaya recommends that you install and configure the WSS before installing an AP. If the switch is already installed and configured for the access points, you can immediately verify the cable connection when you plug the cable into the RJ-45 port on the AP.

Caution! Series 2332 access points are designed to receive power only from an 802.3af-compliant source, an Avaya WLAN—Security Switch (WSS), or an Avaya-approved power injector. Connecting an AP to a Power over Ethernet (PoE) device that is not approved by Avaya can damage the equipment.

(For information about connecting an AP to a WSS port, see "Connecting an AP to a WSS" on page 54.)

Wall installation recommendations

If you plan to install an AP on a partial wall or other vertical surface, orient the top of the access point (the side with the LEDs) toward the intended coverage area. The radio antennas transmit through the top of the access point but not through the bottom (where the bracket is located).

AP Radio Safety Advisories

When you enable the AP radio(s) as part of WSS configuration, the radios are able to receive and transmit radio frequency energy as soon as you connect the AP to the WSS, either directly or through the network.

Radio Frequency Exposure

Federal Communications Commission (FCC) Docket 96-8 for Spread Spectrum Transmitters specifies a safety standard for human exposure to radio frequency electromagnetic energy emitted by FCC-certified equipment. Avaya Series 2332 access point products meet the uncontrolled environmental limits found in OET-65 and ANSI C95.1-1991, if proper installation procedures are followed. To ensure compliance with these exposure requirements, this device must be installed in such a manner as to maintain a minimum of 20 cm separation distance between the radiating element(s) and all persons.

Additional radio safety advisories

(For translations of these warnings, see "Radio safety warnings" on page 136.)

Warning! Install this device in such a manner as to maintain a minimum of 20 cm (7.9 inches) separation distance between the radiating element(s) and all persons. This safety warning conforms with FCC radio frequency exposure limits.

Warning! Do not operate the AP near unshielded blasting caps or in an otherwise explosive environment unless the device has been modified for such use by qualified personnel.

Warning! Do not touch or move the AP when the antennas are transmitting or receiving.

Warning! Before using a wireless device in a hazardous location, consult the local codes, national codes, and safety directors of the location for usage constraints.

Cable requirements

Note. The Series 2332 access point is intended for indoor use only. Do not install the device nor operate it outdoors.

Note. To reduce the possibility of connection interference caused by dust, clean the Cat-5 connector pins before inserting a cable into an AP.

Standard Cat-5 Ethernet cabling is required for use with the 2332 Series.

Cat-5 cable with straight-through signaling must be installed at the site before you install an access point. A single connection requires one cable.

Table 2 lists the pin signals for the 10/100 Ethernet straight-through wiring. Pins 4, 5, 7, and 8 are used when Avaya Power over Ethernet (PoE) is enabled on the port. *RD* stands for *Receive Data* and *TD* stands for *Transmit Data*.

Table 2. 10/100 Ethernet Straight-Through Pin Signals

WSS		Other Device	
Pin	**Function**	**Pin**	**Function**
1	RD+	1	TD+
2	RD-	2	TD-
3	TD+	3	RD+
4	PoE+	4	PoE+
5	PoE+	5	PoE+
6	TD-	6	RD-
7	PoE-	7	PoE-
8	PoE-	8	PoE-

Mounting a Series 2332 access point on a solid surface requires using a Cat-5e cable that does not have strain relief. For installation on all other surfaces, you can use the Cat-5e cable with or without strain relief.

(For more information about cables, see "Cable ports" on page 25.)

Installing a Series 2332 access point

To install a Series 2332 access point, use one of the procedures in this section.

Installation hardware and tools

Table 3 lists the mounting hardware and tools required for each type of installation.

Table 3. Required Mounting Hardware and Tools—Series 2332 access point

Mounting Option	Required Hardware and Tools	Included with the Product
Suspended ceiling—flush ceiling tiles	Mounting template	Yes
	Universal mounting bracket	Yes
	T-bar clamp **Note:** A T-bar clamp is not required for a 23.9-mm (15/16-inch) T-bar ceiling with flush ceiling tiles.	Yes
	Box cutter	No
	Small screwdriver (3-mm or 1/8-inch)	No
Suspended ceiling—drop ceiling tiles	Mounting template	Yes
	Universal mounting bracket	Yes
	T-bar clamp	Yes
	Box cutter	No
	Small screwdriver (3-mm or 1/8-inch)	No
Junction box	Junction box	No
	Two #6-32 x 1-inch machine screws	Yes
	Universal mounting bracket	Yes
	Small screwdriver (3-mm or 1/8-inch)	No
	#2 Phillips-head screwdriver	No

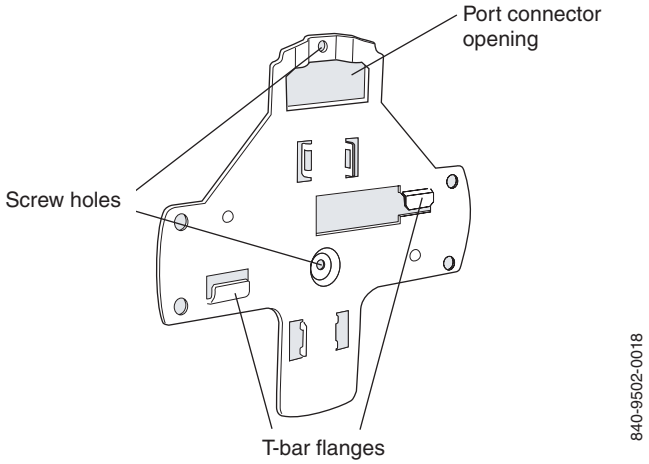
Table 3. Required Mounting Hardware and Tools—Series 2332 access point (continued)

Mounting Option	Required Hardware and Tools	Included with the Product
Solid wall or ceiling	Two #6 sheet metal screws and two drywall anchors	Yes
	Universal mounting bracket	Yes
	Hammer	No
	Small screwdriver (3-mm or 1/8-inch)	No
	#2 Phillips-head screwdriver	No

Note. A Series 2332 access point is plenum rated, so it can also be installed in the space above the ceiling if preferred.

Figure 5 shows the universal mounting bracket.

Figure 5. Universal Mounting Bracket

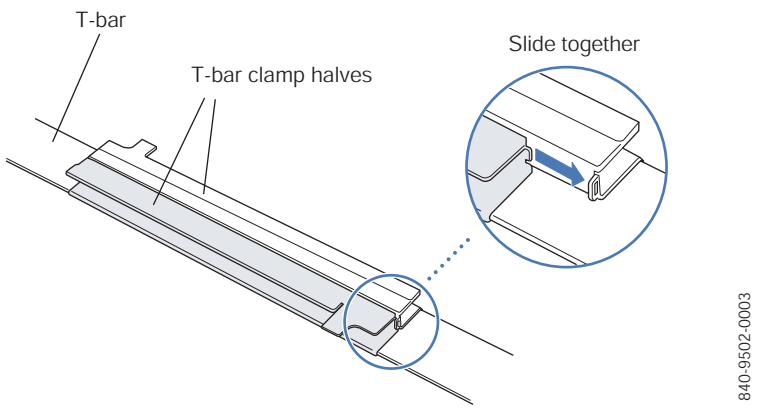


Suspended ceiling installation—flush ceiling tiles

(For required mounting hardware and tools, see Table 3 on page 35.)

1. Select an installation location that is centered over a T-bar in the ceiling.
2. Cut a hole as follows in the ceiling tile for the Cat-5 cable:
   - **a** Place the mounting template over the area where you plan to install the AP.
   - **b** Use the box cutter to cut along the line marking the opening for the port connector.
   - **c** Remove the mounting template and the material you cut from the ceiling panel.
3. Determine whether to install a T-bar clamp onto the ceiling T-bar:
   - If the T-bar width is 14.2 mm (9/16 inches), you need to install the 14.2-mm (9/16-inch) T-bar clamp. Go to step 4.
   - If the T-bar width is 23.9 mm (15/16 inches), the universal mounting bracket fits directly onto the T-bar. Go to step 5.
4. Install the 14.2-mm (9/16-inch) T-bar clamp onto the ceiling T-bar as shown in Figure 6 on page 37.
   - **a** Slide each half of the clamp onto the T-bar so that the clamp lip is fully on the T-bar.
   - **b** Slide the two halves of the clamp toward each other until the tabs are inserted completely into the holes and the clamp fits snugly on the T-bar.

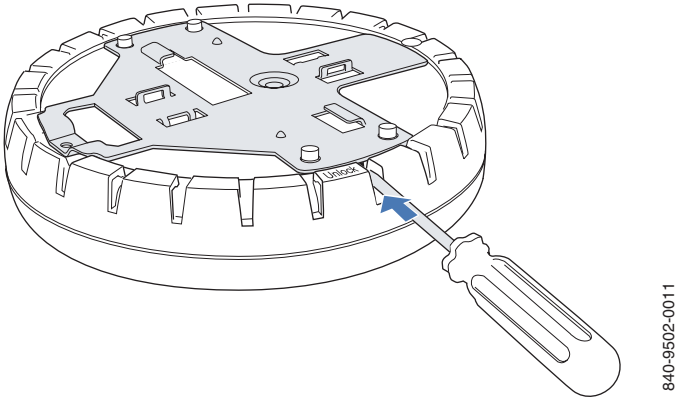
Figure 6. Step 4—Installing a T-bar Clamp



5. Unlock the universal mounting bracket from the AP by inserting the 3-mm or 1/8-inch screwdriver into the *Unlock* hole on the AP as shown in Figure 7.

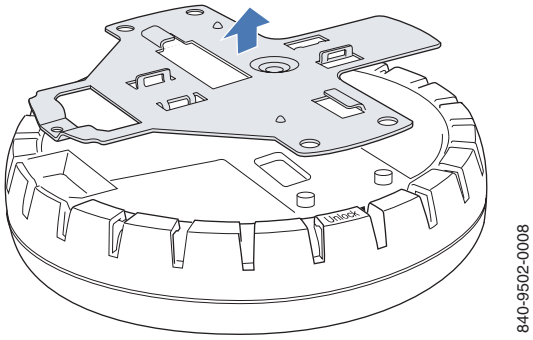
Caution! To avoid damage to the AP's lock mechanism or electronic components, do not use excessive force when inserting a tool into the *Unlock* or *Lock* hole.

Figure 7. Step 5—Unlocking the Bracket



6 Remove the bracket as shown in Figure 8 on page 38.

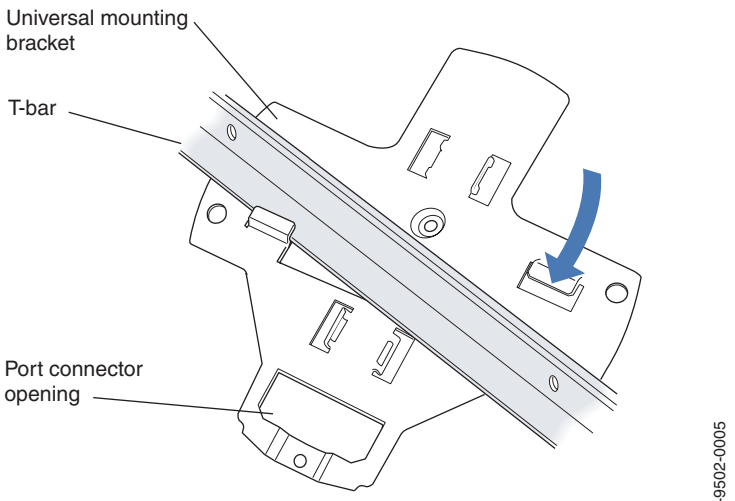
Figure 8. Step 6—Removing the Bracket



7 Install the universal mounting bracket as follows onto the T-bar or T-bar clamp:

a As shown in Figure 9, place the universal mounting bracket against the T-bar or clamp so that the two screw holes face downward and the two T-bar flanges face upward and are adjacent to the T-bar edges.

Figure 9. Step 7—Top View

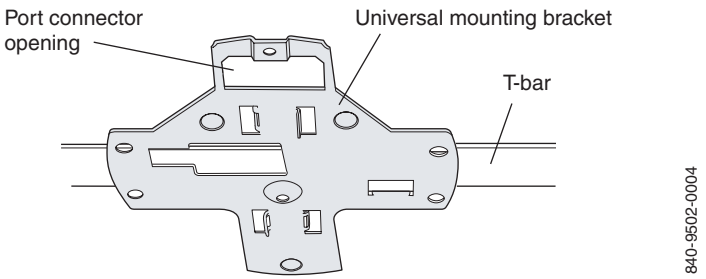


(Viewed from above ceiling tiles, looking down.)

b Properly align the bracket for mounting by placing the bracket so that its port connector opening is to the left of the hole you cut for the cables.

c Rotate the universal mounting bracket clockwise until the flanges snap into place on the T-bar or clamp as shown in Figure 10 on page 39.

Figure 10. Step 7—Bottom View



8 Pull the Cat-5 cable about 15 cm (about 6 inches) out of the hole in the ceiling tile and through the port connector opening to create enough slack to insert the cable.

9 Insert the Cat-5 cable into the connector:

10 Install the Kensington lock (optional).

a Loop the Kensington lock's cable around an object that cannot be moved or damaged by a person pulling on the cable.

b Insert the key into the Kensington lock.

c Insert the Kensington lock into the security slot on the AP.

d Rotate the key right or left to secure the lock to the AP.

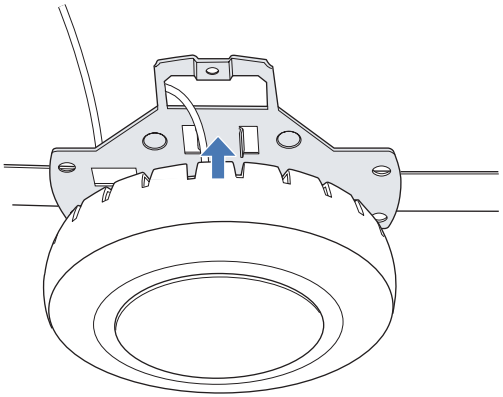
e Pull on the lock to verify that it is secured to the AP.

f Remove the key.

11 Lift the AP into place on the universal mounting bracket as shown in Figure 11 on page 40.

Make sure the cable feeds properly into the ceiling as you lift the device, and does not become trapped between the access point and the bracket.

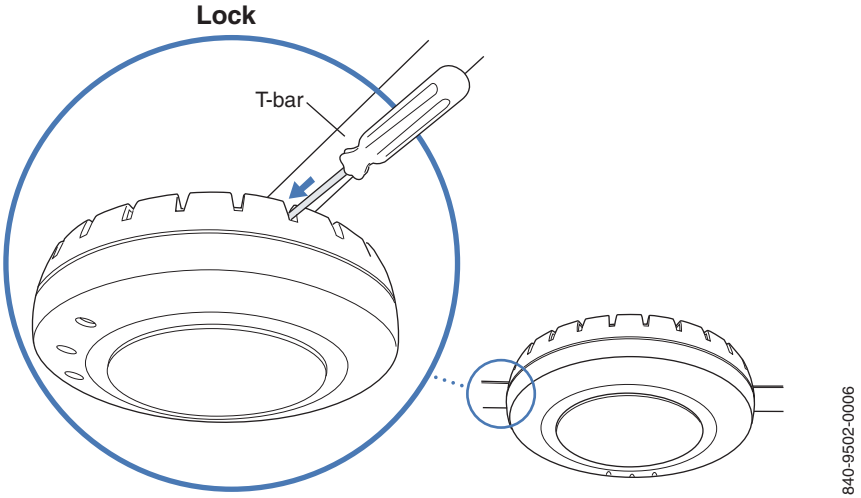
Figure 11. Step 11—Placing the AP on the Bracket



12 Lock the AP onto the bracket by inserting the 3-mm or 1/8-inch screwdriver into the *Lock* hole on the access point as shown in Figure 12.

Warning! To prevent possible damage to the AP, make sure the device is fully locked onto the bracket before releasing it.

Figure 12. Step 12—Locking the Bracket



13 To ensure that the AP is fully locked onto the bracket, gently pull down on the access point and attempt to rotate it from side to side.

14 If the access point comes off the bracket, relock the device onto the bracket as described in step 12 on page 40.

15 If the other end of the Cat-5 cable is not already connected and the link activated, go to "Connecting an AP to a WSS" on page 54. Otherwise, go to "Verifying AP health" on page 56.

Suspended ceiling installation—drop ceiling tiles

(For required mounting hardware and tools, see Table 3 on page 35.)

1 Select an installation location that is centered over a T-bar in the ceiling.

2 Cut a hole as follows in the ceiling tile for the Cat-5 cable:

- **a** Place the mounting template over the area where you plan to install the AP.
- **b** Use the box cutter to cut along the line marking the opening for the point connectors.
- **c** Remove the mounting template and the material you cut from the ceiling panel.

3 Install the T-bar clamp that fits the T-bar:

- **a** Slide each half of the clamp onto the T-bar so that the clamp lip is fully on the T-bar.
- **b** Slide the two halves of the clamp toward each other until the tabs are inserted completely into the holes and the clamp fits snugly on the T-bar.

Figure 13 shows an example for a 23.9-mm (15/16-inch) T-bar. Figure 14 shows an example for a 15.9-mm (5/8-inch) T-bar.

Figure 13. Step 3—Installing the T-bar Clamp for a 23.9-mm (15/16-inch) T-bar

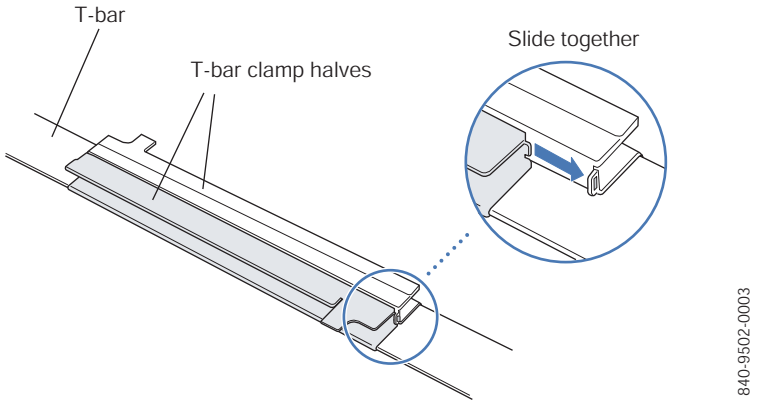
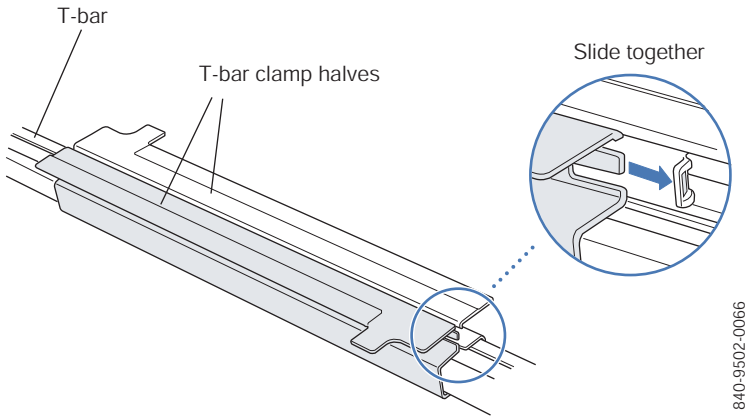


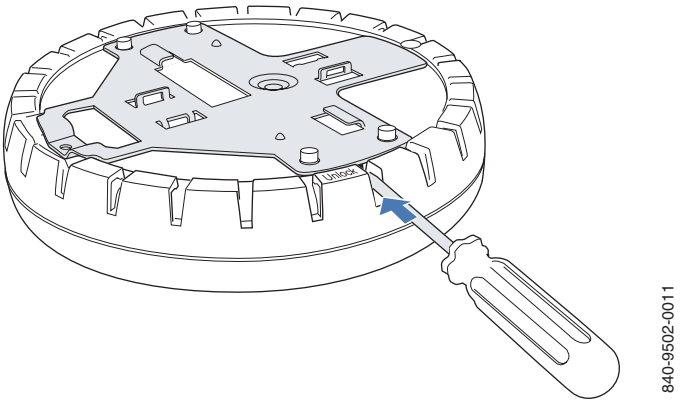
Figure 14. Step 3—Installing the T-bar Clamp for a 15.9-mm (5/8-inch) T-bar



4 Unlock the universal mounting bracket from the AP by inserting the 3-mm or 1/8-inch screwdriver into the *Unlock* hole on the AP as shown in Figure 15.

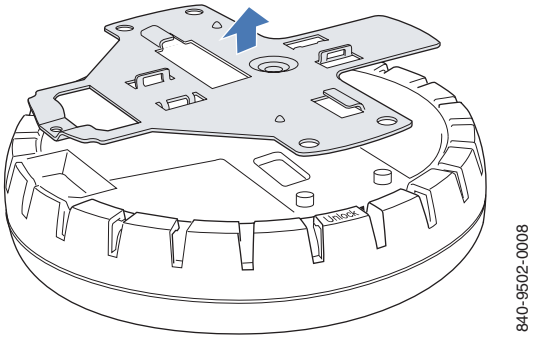
Caution! To avoid damage to the AP's lock mechanism or electronic components, do not use excessive force when inserting a tool into the *Unlock* or *Lock* hole.

Figure 15. Step 4—Unlocking the Bracket



5 Remove the bracket as shown in Figure 16 on page 43.

Figure 16. Step 5—Removing the Bracket



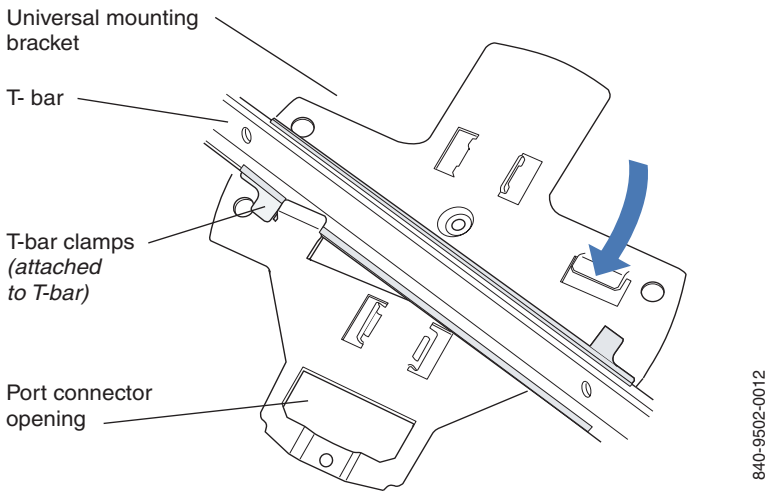
6 Install the universal mounting bracket as follows onto the T-bar clamp:

a As shown in Figure 17, place the universal mounting bracket against the T-bar clamp so that the two screw holes face downward and the two T-bar flanges face upward and are adjacent to the T-bar edges.

b Properly align the bracket for mounting by placing the bracket so that its port connector opening is to the left of the hole you cut for the cables.

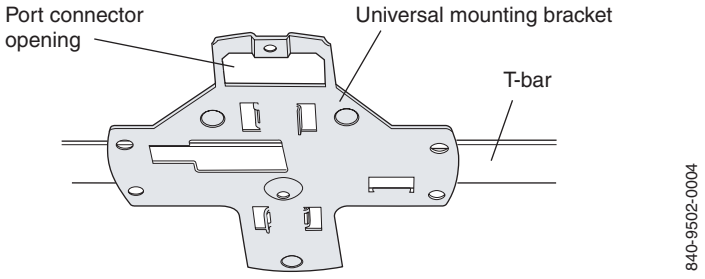
c Rotate the universal mounting bracket clockwise until the flanges snap into place on the T-bar clamp as shown in Figure 18 on page 44.

Figure 17. Step 6—Top View



(Viewed from above ceiling tiles, looking down.)

Figure 18. Step 6—Bottom View



7 Pull the Cat-5 cable about 15 cm (about 6 inches) out of the hole in the ceiling tile and through the port connector opening to create enough slack to insert the cable.

8 Insert the Cat-5 cable into the connector.

9 Install the Kensington lock (optional).

- **a** Loop the Kensington lock's cable around an object that cannot be moved or damaged by a person pulling on the cable.
- **b** Insert the key into the Kensington lock.
- **c** Insert the Kensington lock into the security slot on the AP.
- **d** Rotate the key right or left to secure the lock to the AP.

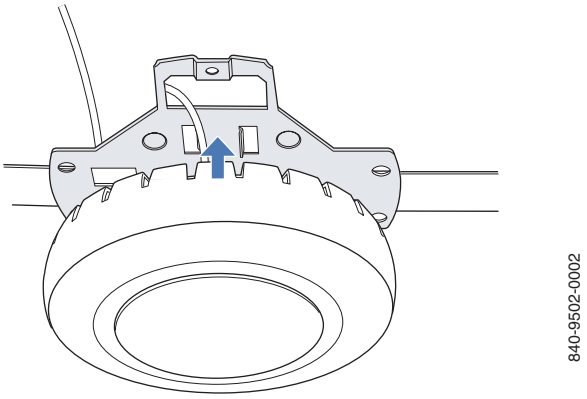
e Pull on the lock to verify that it is secured to the AP.

f Remove the key.

10 Lift the AP into place on the universal mounting bracket as shown in Figure 19 on page 45.

Make sure the cable feeds properly into the ceiling as you lift the device, and does not become trapped between the access point and the bracket.

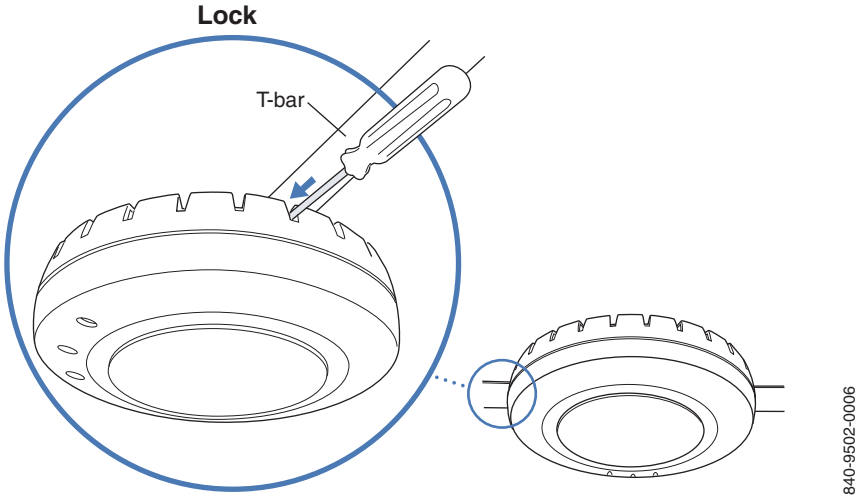
Figure 19. Step 9—Placing the AP on the Bracket



11 Lock the AP onto the bracket by inserting the 3-mm or 1/8-inch screwdriver into the *Lock* hole on the access point as shown in Figure 20.

Caution! To prevent possible damage to the AP, make sure the device is fully locked onto the bracket before releasing it.

Figure 20. Step 10—Locking the Bracket



12 To ensure that the AP is fully locked onto the bracket, gently pull down on the access point and attempt to rotate it from side to side.

If the access point comes off the bracket, relock the device onto the bracket as described in step 11 on page 40.

13 If the other end of the Cat-5 cable is not already connected and the link activated, then go to "Connecting an AP to a WSS" on page 54. Otherwise, go to "Verifying AP health" on page 56.

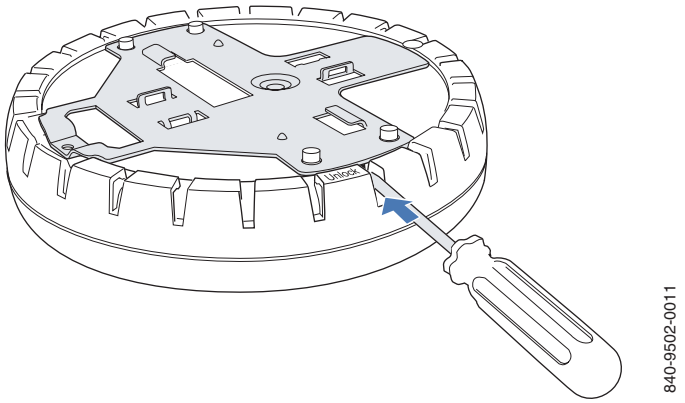
Junction box installation

(For required mounting hardware and tools, see Table 3 on page 35.)

1 Unlock the universal mounting bracket from the AP by inserting the 3-mm or 1/8-inch screwdriver into the *Unlock* hole on the AP as shown in Figure 21.

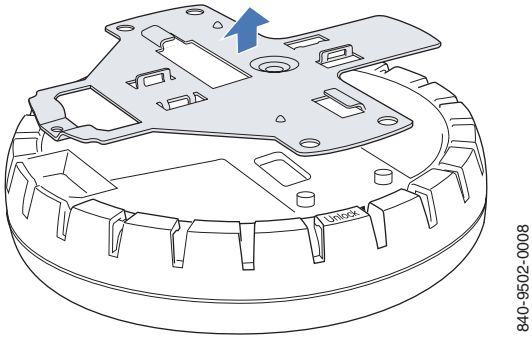
Caution! To avoid damage to the AP's lock mechanism or electronic components, do not use excessive force when inserting a tool into the *Unlock* or *Lock* hole.

Figure 21. Step 1—Unlocking the Bracket



2 Remove the bracket as shown in Figure 22 on page 47.

Figure 22. Step 2—Removing the Bracket

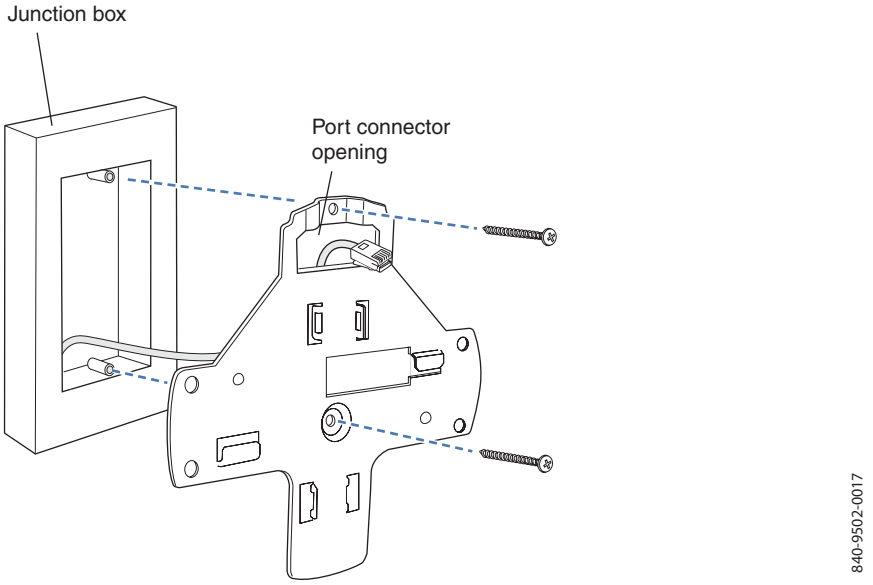


3 Attach the universal mounting bracket to the junction box as shown in Figure 23:

a Place the universal mounting bracket against the junction box so that the two screw holes face the junction box and align over the screw holes in the box.

b Insert the #6-32 x 1-inch machine screws in the universal mounting bracket's screw holes, and use a #2 Phillips-head screwdriver to tighten them.

Figure 23. Step 3—Placing the Bracket on the Junction Box



4 Pull the Cat-5 cable about 15 cm (about 6 inches) out of the junction box and through the port connector opening to create enough slack to insert the cable into the port connector.

5 Insert the Cat-5 cable into the connector.

6 Install the Kensington lock (optional).

- **a** Loop the Kensington lock's cable around an object that cannot be moved or damaged by a person pulling on the cable.
- **b** Insert the key into the Kensington lock.
- **c** Insert the Kensington lock into the security slot on the AP.
- **d** Rotate the key right or left to secure the lock to the AP.
- **e** Pull on the lock to verify that it is secured to the AP.
- **f** Remove the key.

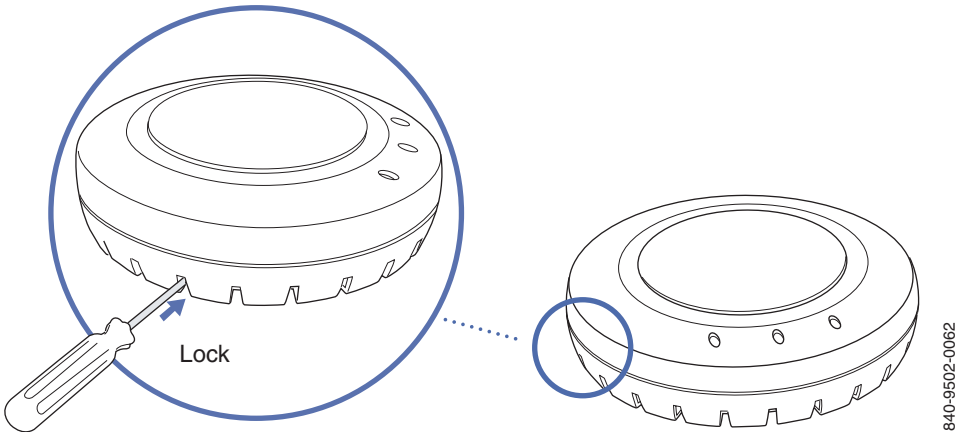
7 Lift the AP into place on the universal mounting bracket.

Make sure the cable feeds properly into the junction box as you lift the device, and does not become trapped between the access point and the bracket.

8 Lock the AP onto the bracket by inserting the 3-mm or 1/8-inch screwdriver into the *Lock* hole on the access point as shown in Figure 24.

Warning! To prevent possible damage to the AP, make sure the device is fully locked onto the bracket before releasing it.

Figure 24. Step 7—Locking the Bracket



9 To ensure that the AP is fully locked onto the bracket, gently pull down on the access point and attempt to rotate it from side to side.

If the access point comes off the bracket, relock the device onto the bracket as described in step 8 on page 49.

10 If the other end of the Cat-5 cable is not already connected and the link activated, go to "Connecting an AP to a WSS" on page 54. Otherwise, go to "Verifying AP health" on page 56.

Solid wall or ceiling installation

(For required mounting hardware and tools, see Table 3 on page 35.)

1 Prepare holes in the wall or ceiling for the universal mounting bracket, using the following steps:

a Place the paper mounting template over the location where you want to install the AP.

b Mark the screw hole location(s).

- If you plan to route the Cat-5 cable externally along the wall or ceiling, mark the locations of both the center screw hole and the screw hole by the port connector opening.

- If you plan to route the Cat-5 cable through a hole in the wall or ceiling, mark the location of the center screw hole only. You cannot use the screw hole by the port connector opening if you cut a hole for the opening.

Note. Do not mark the four holes on the edges of the bracket. (These are the holes indicated by the dashed lines in Figure 27 on page 52.) The AP fits into these holes. They are not screw holes.

c Remove the template.

2 Install the drywall anchor(s):

a Insert a drywall anchor into each hole, up to the beginning of the threads on the anchor.

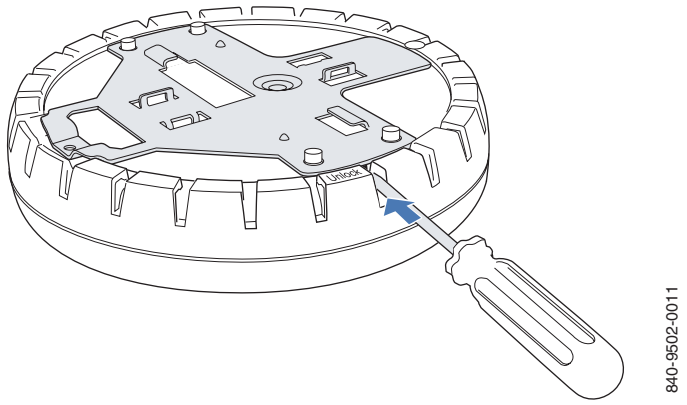
b Screw each anchor the rest of the way into its hole using a #2 Phillips-head screwdriver.

c Remove the screw from each anchor and save the screw(s) for step 6 on page 51.

3 Unlock the universal mounting bracket from the AP by inserting the 3-mm or 1/8-inch screwdriver into the *Unlock* hole on the AP as shown in Figure 25 on page 50.

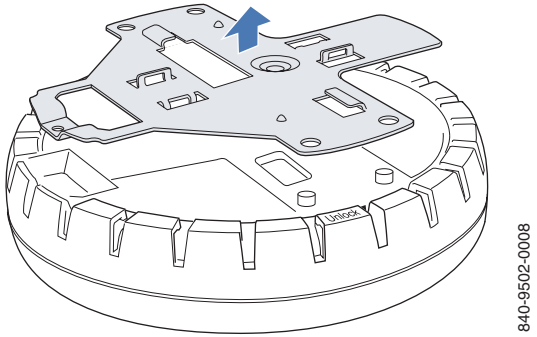
Caution! To avoid damage to the AP's lock mechanism or electronic components, do not use excessive force when inserting a tool into the *Unlock* or *Lock* hole.

Figure 25. Step 3—Unlocking the Bracket



4 Remove the bracket as shown in Figure 26.

Figure 26. Step 4—Removing the Bracket



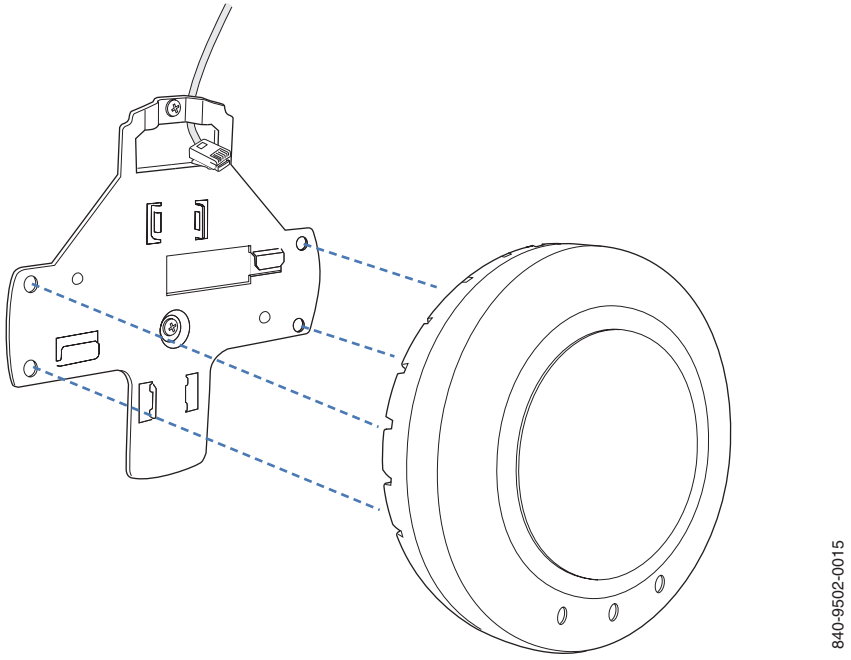
5 As shown in Figure 27 on page 52, feed the Cat-5 cable through the port connector opening and align the universal mounting bracket over the drywall anchors so that the two screw holes in the bracket face the drywall anchors.

6 Insert the #6 sheet metal screws into the screw holes, and tighten them to secure the universal mounting bracket to the wall or ceiling.

(If you routed the Cat-5 cable through a hole in the wall or ceiling, insert the screw into the center screw hole only.)

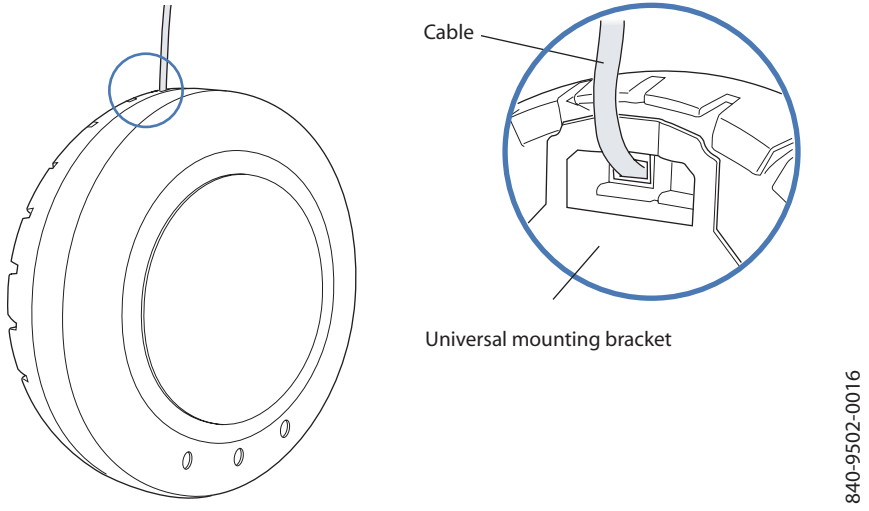
Note. Do not insert screws in the four holes on the edges of the bracket. (These are the holes indicated by the dashed lines in Figure 27.) The AP fits into these holes. They are not screw holes.

Figure 27. Steps 5 and 6—Bracket Placement on Solid Wall or Ceiling



7 As shown in Figure 28, insert the Cat-5 cable into the connector:

Figure 28. Step 8—Cable Placement



8 Install the Kensington lock (optional).

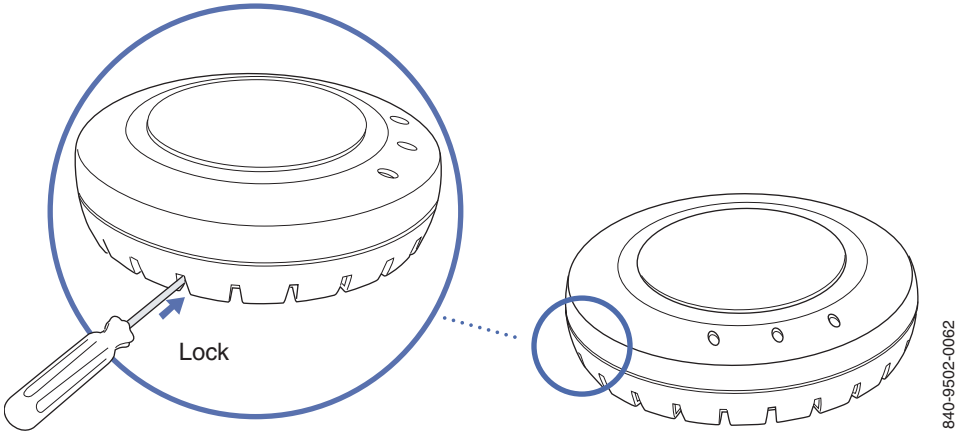
- **a** Loop the Kensington lock's cable around an object that cannot be moved or damaged by a person pulling on the cable.
- **b** Insert the key into the Kensington lock.
- **c** Insert the Kensington lock into the security slot on the AP.
- **d** Rotate the key right or left to secure the lock to the AP.
- **e** Pull on the lock to verify that it is secured to the AP.
- **f** Remove the key.

9 Place the AP on the bracket, making sure to remove any slack that occurs in the cable between the bracket and the AP.

10 Lock the AP onto the bracket by inserting the 3-mm or 1/8-inch screwdriver into the *Lock* hole on the access point as shown in Figure 29.

Warning! To prevent possible damage to the AP, make sure the device is fully locked onto the bracket before releasing it.

Figure 29. Step 9—Locking the Bracket



11 To ensure that the AP is fully locked onto the bracket, gently pull on the access point and attempt to rotate it from side to side.

If the access point comes off the bracket, relock the device onto the bracket as described in step 10 on page 53.

12 If the other end of the Cat-5 cable is not already connected and the link activated, then go to "Connecting an AP to a WSS" on page 54. Otherwise, go to "Verifying AP health" on page 56.

Connecting an AP to a WSS

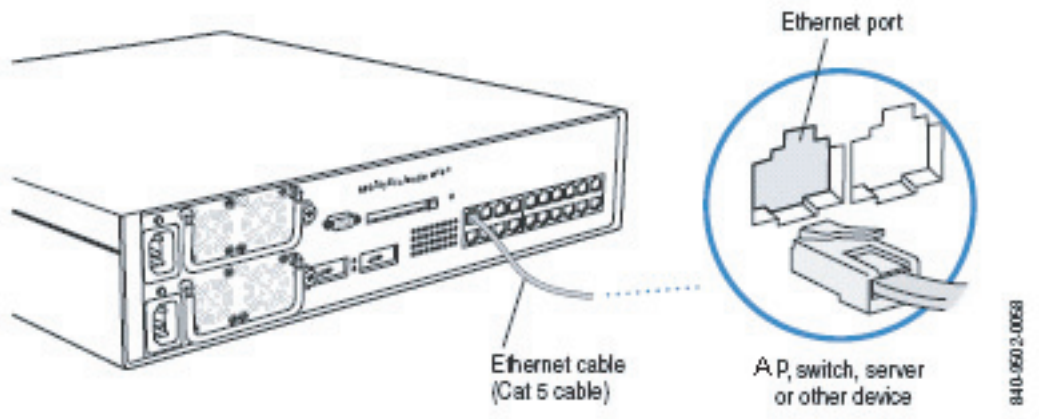
You can connect an AP directly to a WSS or indirectly to the switch through an intermediate Layer 2 or Layer 3 network.

- To connect the AP directly to a WSS, configure the WSS port as an AP and use the following procedure to insert the cable into the WSS and verify the link.
- To connect the AP indirectly to a WSS though the network, configure a Distributed AP connection on the WSS.

You can use the CLI or WLAN Management Software to configure an AP or Distributed AP connection. (See the *Avaya WLAN Security Switch 2300 Series Configuration Guide* or the *Avaya WLAN Management Software 2300 Series User Guide*.)

Figure 30 shows how to insert a Cat-5 cable into a 10/100 Ethernet port on a WSS. Refer to this figure as you perform the procedure.

Figure 30. 10/100 Cat-5 Cable Installation



1. Insert a Cat-5 cable with a standard RJ-45 connector as shown in Figure 30. For connection to an AP, use the supplied Cat-5 straight-through cable.
2. When the link is activated, observe the AP LED for the port on the WSS:

AP LED Appearance	Meaning
Solid green	For an AP's active link, all the following are true: • AP has booted. • AP has received a valid configuration from the WSS. • Management link with an AP is operational. • At least one radio is enabled or is in sentry mode. For an AP's secondary link, the link is present.
Alternating green and amber	AP is booting with an image received from the WSS. After the access point boots and receives its configuration, this LED appearance persists until a radio is enabled or is placed in sentry mode.
Solid amber	PoE is on.
Blinking amber	AP is unresponsive or there is a PoE problem.
Unlit	PoE is off.

Note. The 10/100 Ethernet ports on a WSS are configured as wired network ports by default. You or the system administrator must change the port type for a WSS port directly connected to an AP to activate the link. (See the *Avaya WLAN 2300 Series—Security Switch Installation and Basic Configuration Guide*.)

Verifying AP health

After you install the AP and enable PoE on the Ethernet cable connected to the AP, you can easily verify the AP's status by observing the LEDs, particularly the health LED. (See Figure 3 on page 26.)

The health or LINK LED indicates whether the AP is ready for operation.

- If the LED is green and glowing steadily, the AP has been booted successfully by the WSS and is ready for operation.
- If the LED is not steadily glowing green, contact the system administrator for the WSS or, if you are the system administrator, see Appendix , "AP troubleshooting," on page 125.

Series 2332 Access Point Region Lock Mechanism

A regional regulatory lock function has been implemented in the Series 2332 access points to manage the various worldwide operating channels and country approval requirements. The regional lock function contains sixteen (16) regions that are grouped by their operating frequency channels for both the 2.4 GHz and 5.0 GHz 802.11a/b/g bands for indoor operation. The following is a current list of the proposed regions:

Region Names	Regions	
US Based	**US Based**	
2332-A4	11 : 1, 2, 4, 7	2.4 : 5.1, 5.2, 5.4, 5.7
2332-A3	11 : 1, 2, 7	2.4 : 5.1, 5.2, 5.7
2332-A1	11 : 1, 7	2.4 : 5.1, 5.7
2332-A2	11 : 2, 7	2.4 : 5.2, 5.7
2332-A5	11 : 7	2.4 : 5.7
2332-A6	11 : NO 5	2.4 : NO 5.0 GHz
EU Based	**EU Based**	
2332-E4	13 : 1, 2, 4, 7	2.4 : 5.1, 5.2, 5.4, 5.7
2332-E1	13 : 1, 2, 4	2.4 : 5.1, 5.2, 5.4
2332-E3	13 : 1, 2, 7	2.4 : 5.1, 5.2, 5.7
2332-E2	13 : 1, 2	2.4 : 5.1, 5.2
2332-E5	13 : 1, 7	2.4 : 5.1, 5.7
2332-E6	13 : 2, 7	2.4 : 5.2, 5.7
2332-E7	13 : 1	2.4 : 5.1
2332-E8	13 : 7	2.4 : 5.7
2332-E9	13 : NO 5	2.4 : NO 5.0 GHz
Specials	**Specials**	**Specials**
2332-J1	14 : 1, 2	2.4 : 5.1, 5.2

IEEE 802.11a/b/g Channel Designations:

2400 - 2483.5 MHz band

IEEE Mode	**11b/g**	**11b/g**	**11b/g**	**11b/g**	**11b/g**	**11b/g**	**11b/g**	**11b/g**	**11b/g**	**11b/g**	**11b/g**
Channel Number	1	2	3	4	5	6	7	8	9	10	11
Frequency [GHz]	2.412	2.417	2.422	2.427	2.432	2.437	2.442	2.447	2.452	2.457	2.462
IEEE Mode	11b/g	11b/g	11b/g								
Channel Number	12	13	14								
Frequency [GHz]	2.467	2.472	2.484								

Legend:

- 11: Channels 1 through 11, inclusive (US Based)
- 13: Channels 1 through 13, inclusive (EU Based)
- 14: Channels 1 through 14, inclusive (Japan Based)

5.15 - 5.35 GHz bands

IEEE Mode	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**
Channel Number	36	40	44	48	52	56	60	64
Frequency [GHz]	5.180	5.200	5.220	5.240	5.260	5.280	5.300	5.320

5.470 - 5.725 GHz bands

IEEE Mode	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**	**11a**
Channel Number	100	104	108	112	116	120	124	128	132	136	140
Frequency [GHz]	5.500	5.520	5.540	5.60	5.580	5.600	5.620	5.640	5.660	5.680	5.700

5.725 - 5.85 GHz bands

IEEE Mode	**11a**	**11a**	**11a**	**11a**	**11a**
Channel Number	149	153	157	161	165
Frequency [GHz]	5.745	5.765	5.785	5.805	5.825

Legend:

- 1: Channels 36, 40, 44, 48
- 2: Channels 52, 56, 60, 64
- 4: Channels 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140
- 7: Channels 149, 153, 157, 161, 165
- All combinations, such as 1, 2, 7 represent all of the channels listed in the separate sections of 1, 2 and 7: 36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165

The 2332-A1 and 2332-E1 operating channels are listed below for reference:

2332-A1:	2.4 GHz band (802.11b/g):	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
	5.0 GHz bands (802.11a):	36, 40, 44, 48, 149, 153, 157, 161, 165
2332-E1:	2.4 GHz band (802.11b/g):	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
	5.0 GHz bands (802.11a):	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 136, 140

External Antennas

This section introduces the external antenna portfolio available for the Series 2332 access points.

- The portfolio includes 802.11b/g (2.4 GHz), 802.11a (5.0 GHz) and 802.11a/b/g (2.4/5.0 GHz) models.
- The addition of external antennas to the WLAN 2300 System portfolio improves overall system value:
  - Improved deployment flexibility – Planners can choose an antenna pattern that meets coverage requirements while allowing for convenient AP placement and installation.
  - Improved coverage and performance – External antennas allow planners to optimize coverage and deliver higher available data rates to user concentrations.
  - Can provide a low cost fix for trouble spots - Appropriately outfitting existing APs with external antennas can greatly improve coverage and available data rates in areas that are not adequately serviced.
  - Increased security – Perimeter access points outfitted with directional external antennas can focus energy inwards and increase security by preventing signal “leakage” outside the office.
  - Improved aesthetics – External antennas feature a 3 foot cable that allows the connected access point to be installed out-of-sight.
  - Lower cost of coverage – External antennas improve overall system efficiency by effectively directing available energy to where it’s needed. This ensures overall system utility is maximized for any installation.

The WLAN 2300 series external antennas are the only external antennas certified by Avaya for use with WLAN 2300 systems. **WLAN Series 2332 Access Points outfitted with non-certified external antennas are not supported under support agreements.**

The WLAN 2300 system must be upgraded to WSS Software v6.0 (or later) and WMS v6.0 (or later) in order to support Series 2332 access points and their associated external antennas. This upgrade includes antenna pattern libraries for the WLAN 2300 series external antenna portfolio and allows the system to:

- Accurately predict RF environments when using the WMS planning tool to calculate coverage provided by access points equipped with external antennas.
- Correctly interpret received signal strength measurements from APs with external antennas when calculating rogue device or client location.

The WLAN 2300 System external antenna portfolio is sourced from Cushcraft, a world leader in the development of advanced antenna technology and products.

- The Cushcraft products have been modified for compatibility with the Series 2332 access points.
- Avaya versions are equipped with an R-SMA (reverse SMA) type connector to comply with industry regulatory quality standards and correctly interface with the Series 2332 access points.
- The Cushcraft model numbers presented throughout this bulletin refer to the Avaya specific versions and may not exactly match similar versions promoted on Cushcraft's website or other product materials.
- Avaya has tested and measured each product. The antenna gains expressed in dBi are the Avaya tested values and may differ slightly from those published by Cushcraft for similar products.

External antenna selector guide for the Series 2332 Access Points for indoor operation

Warning! Intentional radiators, such as the WLAN Series 2332 Access Points, are not intended to be operated with any antenna(s) other than those furnished by . An intentional radiator may only be operated with the antenna(s) with which it is authorized. For a complete listing of antennas for use with this product, visit http://www.avaya.com/support.

Table 4. External Antenna Selector Guide for Series 2332 Access Points

Cushcraft	Model Number	WSS Model String	2.4 GHz Antennas
S2403BPXN36RSM	DR4000088E6	24493	WLAN Collinear Omni-directional Dipole Antenna contains two collocated elements with an average gain of 4.9 dBi and a 3-foot cable with a Reverse SMA connector. For use in Warehouses, Auditoriums, Shopping Malls, industrial complexes and more. It can be mounted either on a pole or hung from a ceiling.
S2406PN36RSM	DR4000075E6	24553	WLAN Directional Patch Panel Antenna with an average gain of 6.5 dBi and a 3-foot cable with a Reverse SMA connector. For use in Hallways or corridors. Easy to disguise or hide.
SL2402PN36RSM	DR4000074E6	24203	WLAN Omni-directional Patch Panel Ceiling Mount Antenna with an average gain of 0.0 dBi and a 3-foot cable with a Reverse SMA connector. For use in contemporary in-building WLAN applications.

SQ2405DDN36RSM	DR4000073E6	24403	WLAN Bi-directional Patch Panel Ceiling Mount Antenna with an average gain of 4.5 dBi and a 3-foot cable with a Reverse SMA connector. For use in Offices, Shopping Complexes, Transportation Terminals, Educational Campuses, Hallways, and Tunnels.
S2409PN36RSM	DR4000076E6	24883	WLAN Directional Patch Panel Array Antenna with an average gain of 8.8 dBi and a 3-foot cable with a Reverse SMA connector. For use where a shaped pattern is needed to provide enhanced coverage of deep rooms, warehouse bays, or any elongated activity zone
PC2415NA36RSM	DR4000077E6	24143	WLAN 15-Element Yagi Antenna with an average gain of 14.1 dBi, 3-foot cable with a Reverse SMA connector and an articulating mount. Antenna is rugged, easy to install and provides a very symmetrical and uniform pattern. Designed for long, narrow coverage environments, like a tunnel.
SR24120DN36RSM	DR4000087E6	24113	WLAN Directional Patch Panel Array Antenna with an average gain of 11 dBi, 3-foot cable with a Reverse SMA connector and either a tilt, wall or pole mounting capability. Antenna is rugged, easy to install and provides a very symmetrical uniform 120 degree H-plane and 14 degree E-plane pattern. Designed for long, wide coverage environments.

S241290PN36RSM	DR4000086E6	24123	WLAN Directional Patch Panel Array Antenna with an average gain of 12 dBi, 3-foot cable with a Reverse SMA connector and either a tilt, wall or pole mounting capability. Antenna is rugged, easy to install and provides a very symmetrical and uniform 90 degree H-plane and 17 degree E-plane pattern. Designed for long, wide coverage environments.
Cushcraft	**Model Number**	**WSS Model String**	**5.0 GHz Antennas**
SQ5153WPN36RSM	DR4000069E6	5303	WLAN Squint Ceiling Mount Omni-directional Monopole Antenna with an average gain of 3.2 dBi from 5.15 - 5.25 GHz, 2.5 dBi from 5.25 - 5.35 GHz, 1.6 dBi from 5.470 - 5.725 GHz and 0.1 dBi from 5.725 - 5.85 GHz. It has a 3-foot cable with a Reverse SMA connector. For use in large indoor spaces, locations with high ceilings, and where extending coverage is needed.
S5153WBPN36RSM	DR4000070E6	5643	WLAN Collinear Omni-directional Dipole Antenna that contains two collocated elements. It has an average gain of 4.5 dBi from 5.15 - 5.25 GHz, 3.8 dBi from 5.25 - 5.35 GHz, 4.7 dBi from 5.47 -5.725 GHz and 4.4 dBi from 5.725 - 5.85 GHz. It is 7" in height, and has a 3-foot cable with a Reverse SMA connector. For use in Warehouses, Auditoriums, Shopping Malls, industrial complexes and other locations.

S51514WPN36RSM	DR4000071E6	5133	WLAN Directional Patch Panel Antenna with an average gain of 13.1 dBi from 5.15 - 5.25 GHz, 13.0 dBi from 5.25 - 5.35 GHz, 13.0 dBi from 5.470 - 5.725 GHz and 12.9 dBi from 5.725 - 5.85 GHz. It has a 3-foot cable with a Reverse SMA connector. For use in campus or in-building applications. It offers a very precise and controllable pattern. Must order mounting bracket separately.
S4901790PN36RS	DR4000090E6	5173	WLAN Directional Patch Panel Antenna with an average gain of 15.7 dBi from 5.15 - 5.25 GHz, 15.9 dBi from 5.25 - 5.35 GHz, 16.0 dBi from 5.470 - 5.725 GHz and 15.8 dBi from 5.725 - 5.85 GHz. It has a 3-foot cable with a Reverse SMA connector and either a tilt, wall or pole mounting capability. Antenna is rugged, easy to install and provides a very symmetrical and uniform 90 degree H-plane and 5.5 degree E-plane pattern. Designed for long, wide coverage environments.
SR49120DAN36RS	DR4000091E6	5103	WLAN Directional Patch Panel Antenna with an average gain of 10.0 dBi from 5.15 - 5.25 GHz, 9.9 dBi from 5.25 - 5.35 GHz, 9.6 dBi from 5.470 - 5.725 GHz and 9.5 dBi from 5.725 - 5.85 GHz. It has a 3-foot cable with a Reverse SMA connector and either a wall or pole mounting capability. Antenna is rugged, easy to install and provides a very symmetrical and uniform 120 degree H-plane and 15 degree E-plane pattern. Designed for long, wide coverage environments.

			2.4/5.0 GHz Dual Antennas
S24493DSN36RSM	DR4000078E6	Mixed	WLAN Dual-Band, Tri-Mode 802.11 a/b/g Spatial Diversity Monopole Antenna. It operates over the 2.4 - 2.5 GHz and 4.90 - 5.875 GHz bands. It has an average gain of 3.0 dBi from 2.4 - 2.5 GHz, 4.0 dBi from 4.90 - 5.15 GHz, 3.9 dBi from 5.15 - 5.25 GHz, 3.2 dBi from 5.25 - 5.35 GHz, 2.9 dBi from 5.470 - 5.725 GHz and 2.6 dBi from 5.725 - 5.85 GHz. It is equipped with a 3-foot cable and a Reverse SMA connector. Each antenna port can be used individually to support 802.11 b/g and 802.11a systems simultaneously for dual-band, non-diversity applications. Optimal for use in high data rate, high capacity configurations such as enterprise offices.

Antenna selection decision trees

The following decision trees are intended to quickly guide users to the appropriate model(s) based on basic criteria.

- The distinction between office and industrial types refers solely to the aesthetic suitability of an antenna for each environment. Any antenna identified as suitable for office deployments can be deployed in industrial environments and vice versa.
- The Antenna # can be used to quickly identify the appropriate corresponding model in the Antenna Descriptions section.
- Only one model of dual-band antenna is available for 802.11a/b/g installations - a Dual-band, Tri-mode 802.11a/b/g Spatial Diversity Antenna, model #: DR4000078E6. This unit has a 2.4 GHz and 5 GHz antenna built-in. It is designed to connect to each of the external ports on the AP. It can be used with only one port connected, so it could be used in either **b/g** or **a** mode in a stand alone application For more information see "Dual-band, Tri-mode 802.11a/b/g Spatial Diversity Antenna" in the Antenna Descriptions section.

Figure 31. 5 GHz Antennas

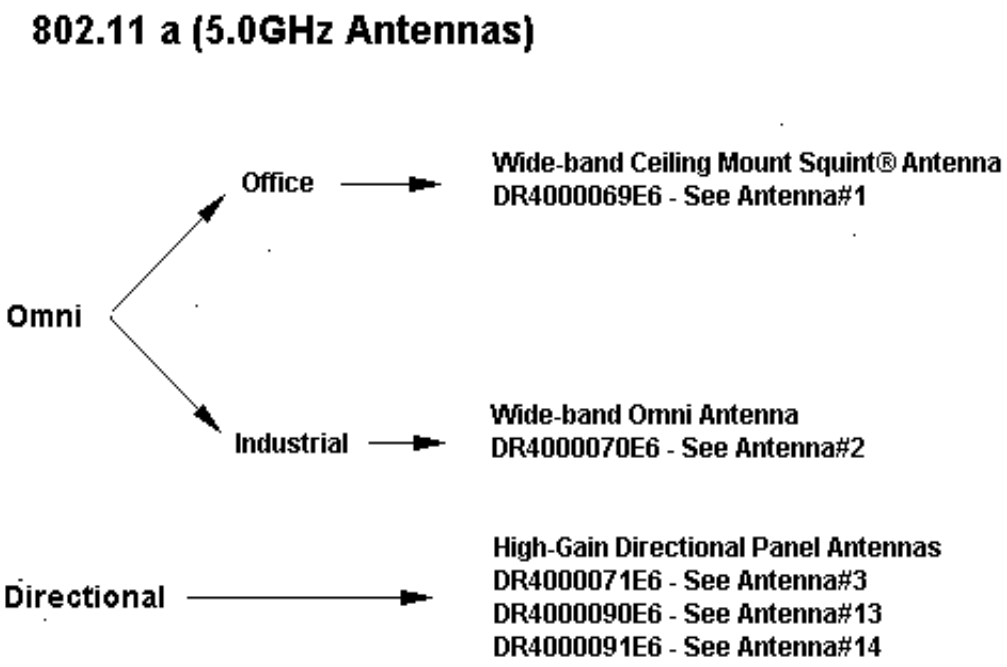
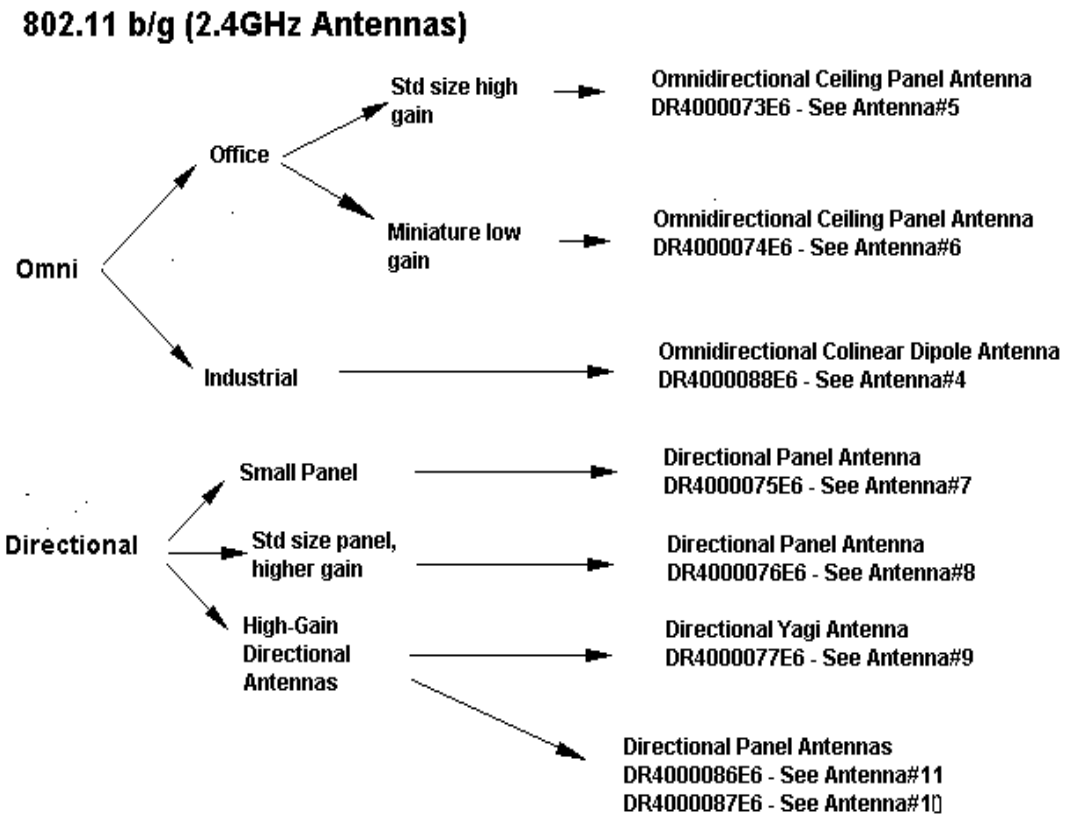


Figure 32. 2.4 GHz Antennas



Dual-Band 802.11a/b/g (2.4/5.0 GHz)

- Dual-band, Tri-mode 802.11a/b/g Spatial Diversity Antenna, DR4000078E6 – See "Dual-band, Tri-mode 802.11a/b/g Spatial Diversity Antenna"

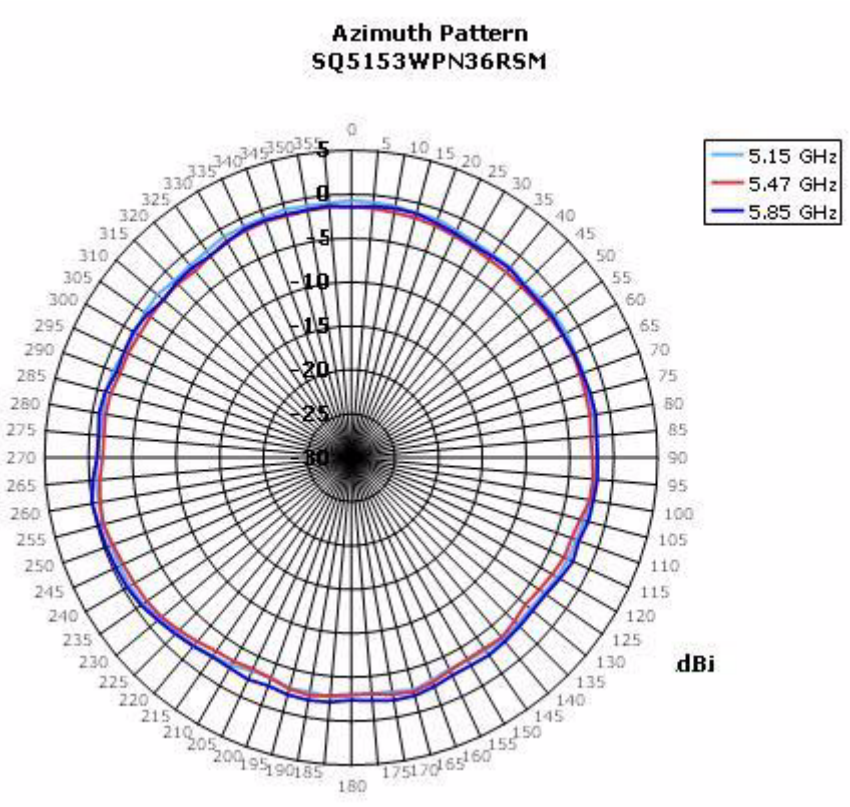
Antenna descriptions – 802.11a (5.0 GHz) antennas

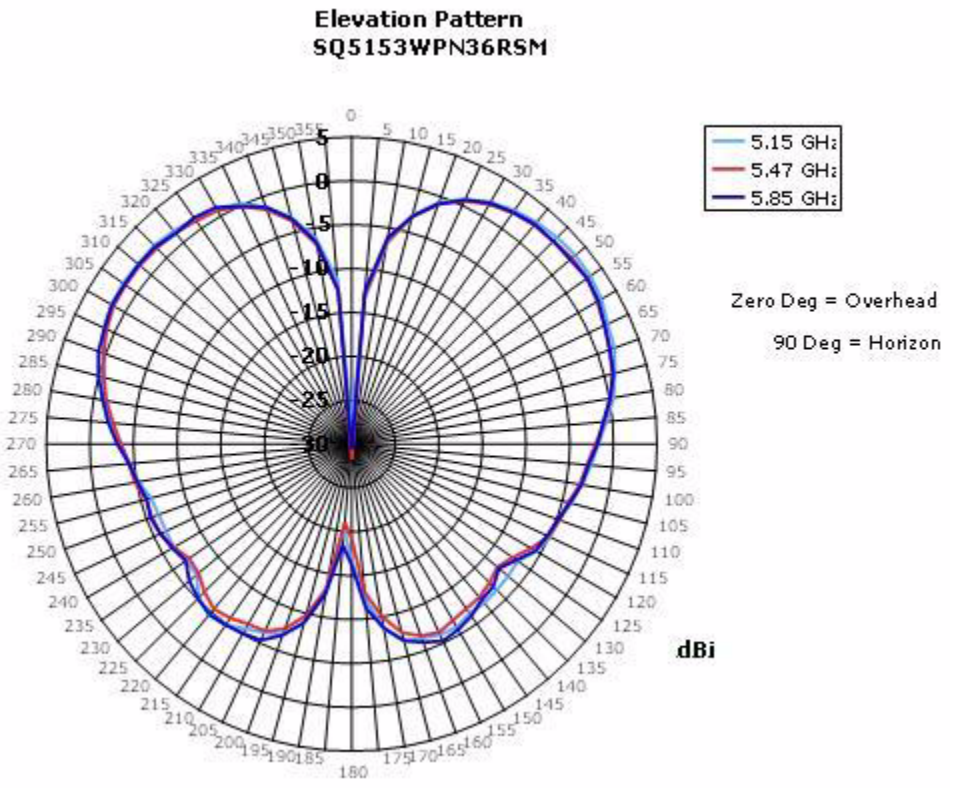
1 Wide-band Ceiling Mount Squint® Antenna

Order Number: DR4000069E6

- Cushcraft Model SQ5153WPN36RSM
- 5.15 - 5.25 GHz, 3.2 dBi Peak Gain
- 5.25 - 5.35 GHz, 2.5 dBi Peak Gain
- 5.470 - 5.725 GHz, 1.6 dBi Peak Gain

- 5.725 - 5.85 GHz, 0.1 dBi Peak Gain
- Ultra-compact, low profile design with minimum visual impact
- Ideal for large indoor open spaces and locations with high ceilings
- Measures 2” x 2” x ¾”

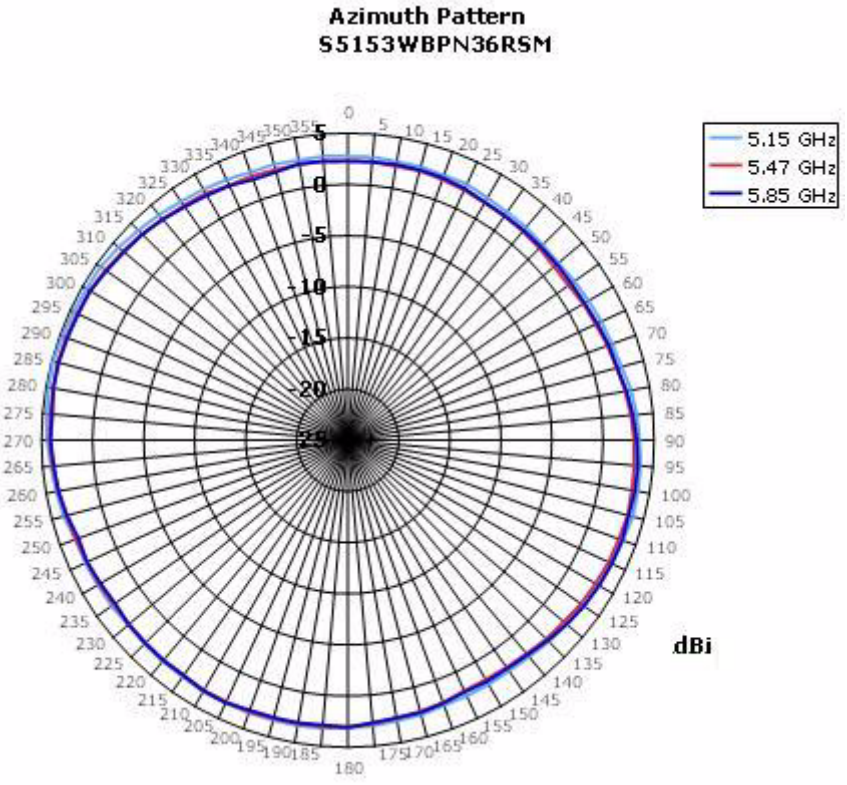

Azimuth Pattern
SQ5153WPN36RSM
5.15 GHz
5.47 GHz
5.85 GHz
dBi
5
0
-5
-10
-15
-20
-25
-30

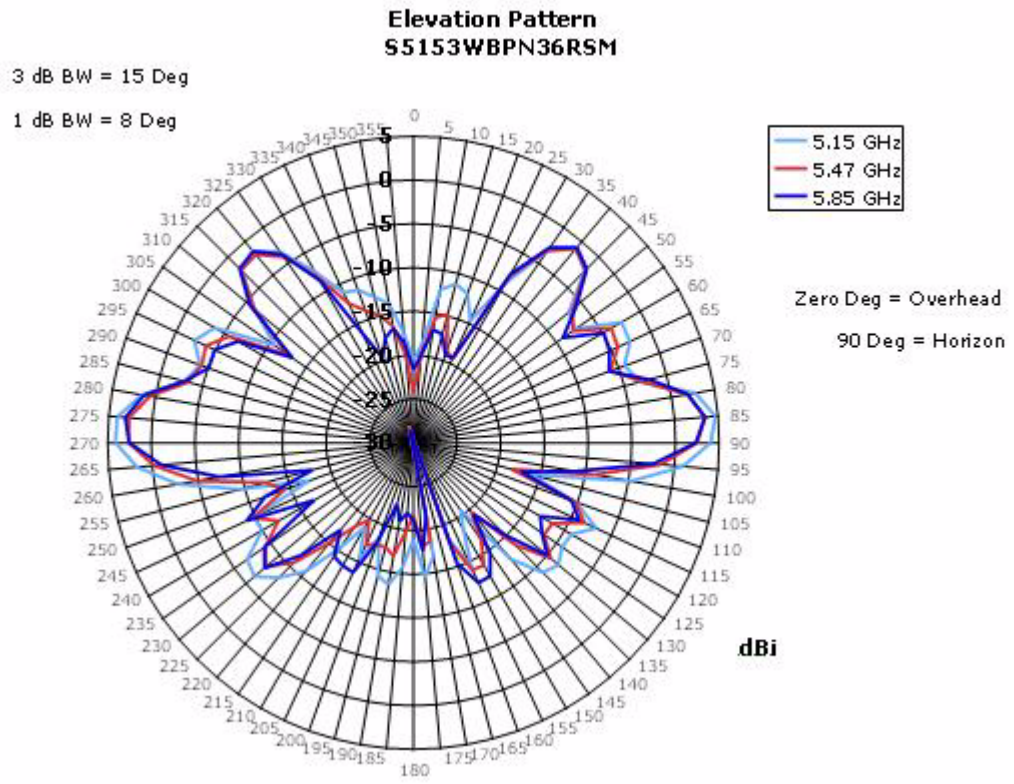

Elevation Pattern
SQ5153WPN36RSM
5.15 GHz
5.47 GHz
5.85 GHz
Zero Deg = Overhead
90 Deg = Horizon
dBi
5
0
-5
-10
-15
-20
-25
-30

2 Wide-band Omni Antenna

Order Number: DR4000070E6

- Cushcraft Model S5153WBPN36RSM
- 5.15 - 5.25 GHz, 4.5 dBi Peak Gain
- 5.25 - 5.35 GHz, 3.8 dBi Peak Gain
- 5.470 - 5.725 GHz, 4.7 dBi Peak Gain
- 5.725 - 5.85 GHz, 4.4 dBi Peak Gain
- Rugged design suitable for industrial environments
- Ceiling, I-beam and mast mounting options
- Suitable for large indoor open spaces and locations with high ceilings
- Slim aspect measuring 11.5” x 1”

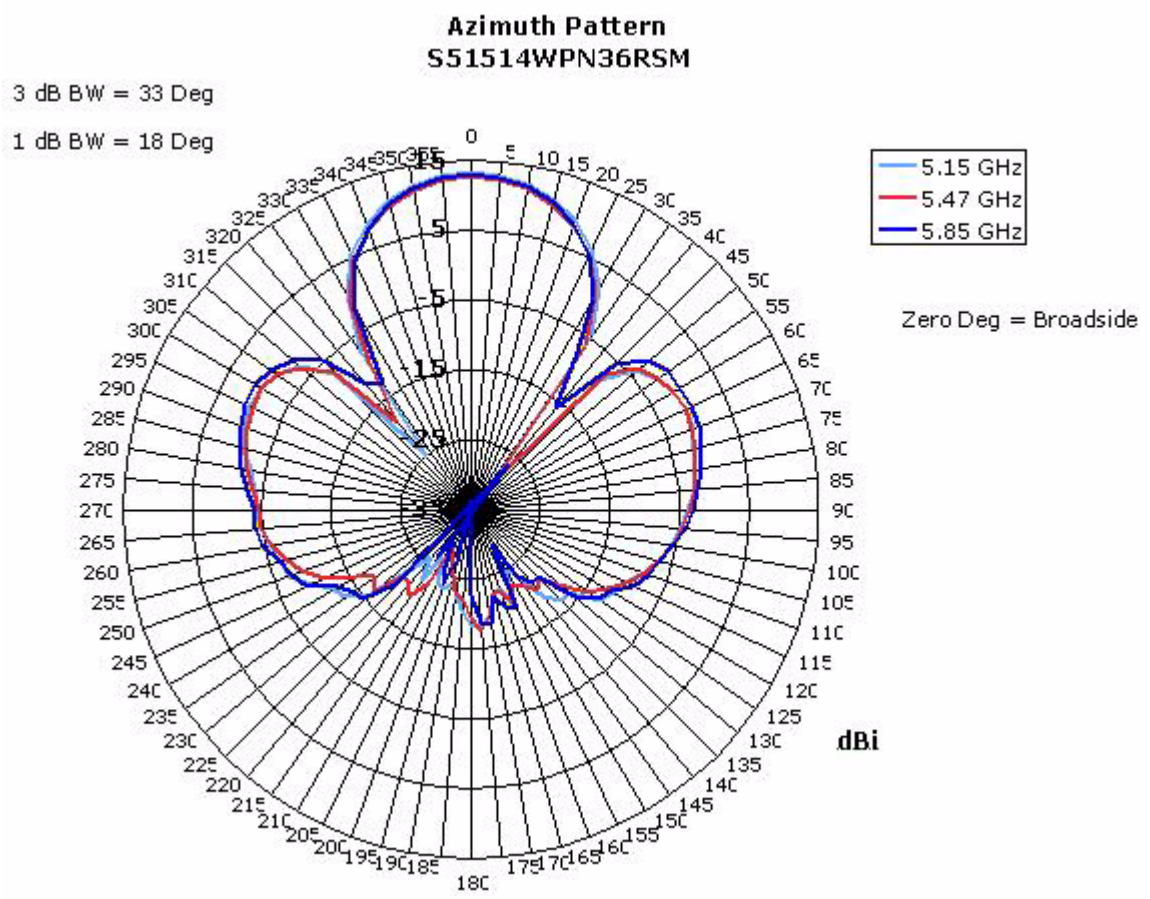

Azimuth Pattern
S5153WBPN36RSM
5.15 GHz
5.47 GHz
5.85 GHz
dBi

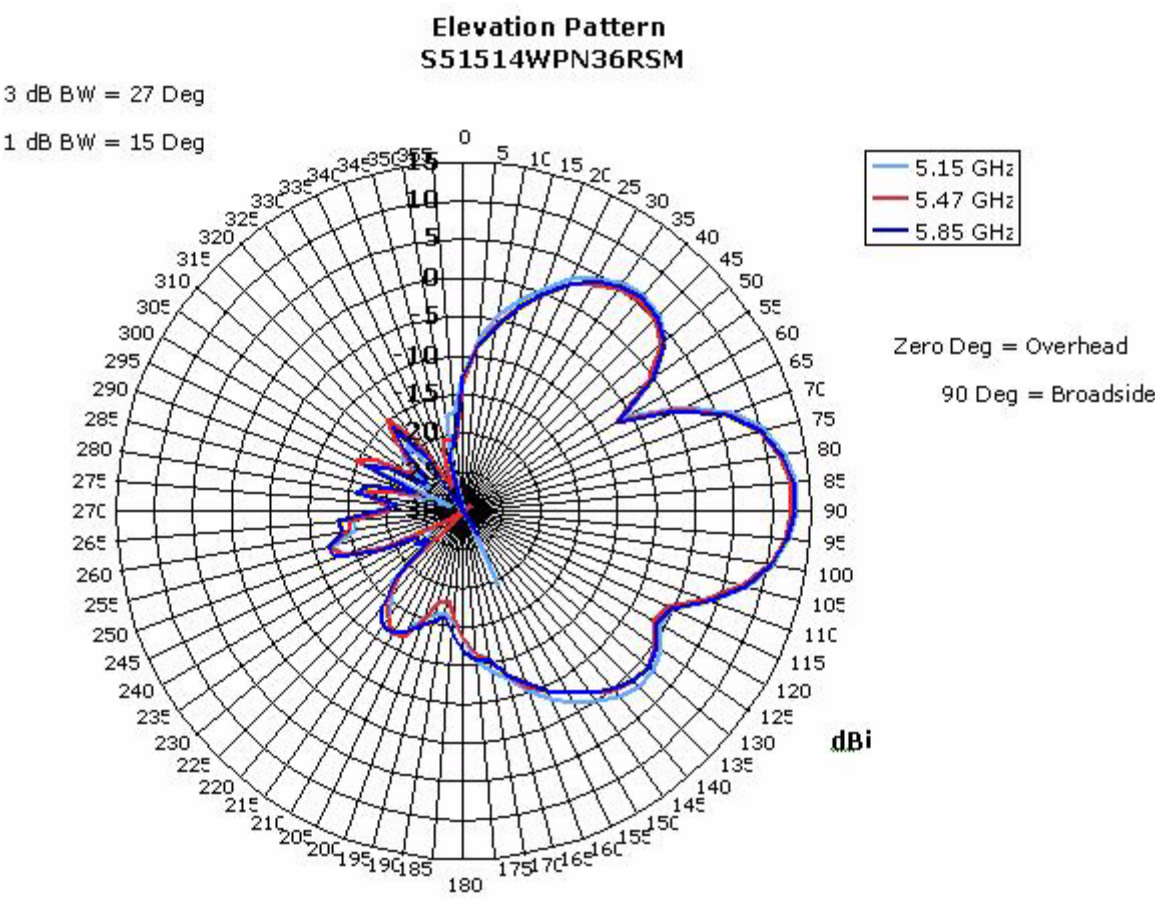

Elevation Pattern
S5153WBPN36RSM
3 dB BW = 15 Deg
1 dB BW = 8 Deg
5.15 GHz
5.47 GHz
5.85 GHz
Zero Deg = Overhead
90 Deg = Horizon
dBi

3 High-Gain Directional Panel Antenna

Order Number: DR4000071E6

- Cushcraft Model S51514WPN36RSM
- 5.15 - 5.25 GHz, 13.1 dBi
- 5.25 - 5.35 GHz, 13.0 dBi Peak Gain
- 5.470 - 5.725 GHz, 13.0 dBi Peak Gain
- 5.725 - 5.85 GHz, 12.9 dBi Peak Gain
- Wall or pole mounting
- Articulating feature allows customizable antenna pattern
- Measures 4” x 4” x 1.4”

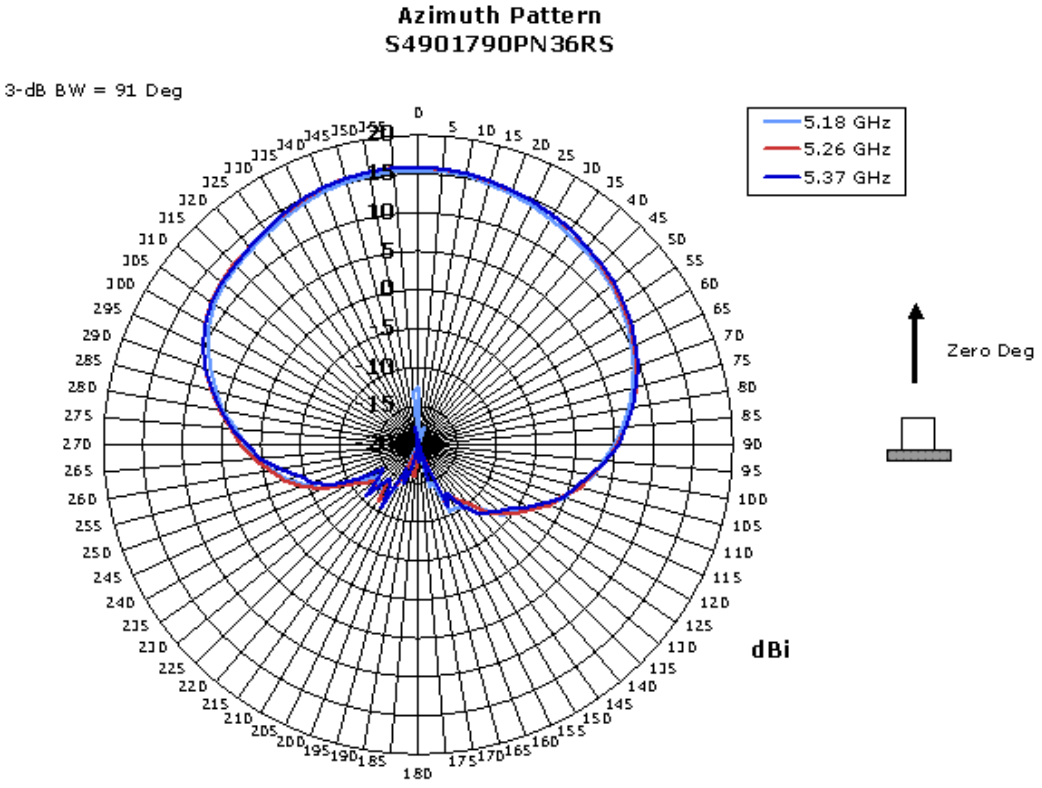

Azimuth Pattern
S51514WPN36RSM
3 dB BW = 33 Deg
1 dB BW = 18 Deg
5.15 GHz
5.47 GHz
5.85 GHz
Zero Deg = Broadside
dBi

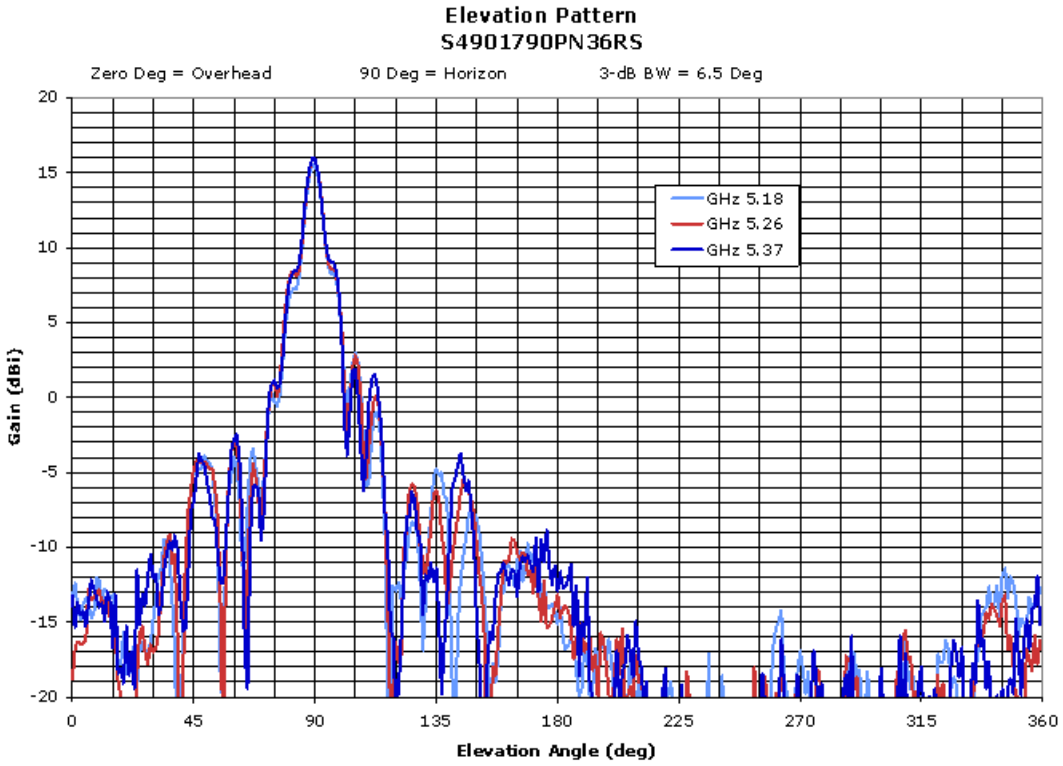

Elevation Pattern
S51514WPN36RSM
3 dB BW = 27 Deg
1 dB BW = 15 Deg
5.15 GHz
5.47 GHz
5.85 GHz
Zero Deg = Overhead
90 Deg = Broadside
dBi

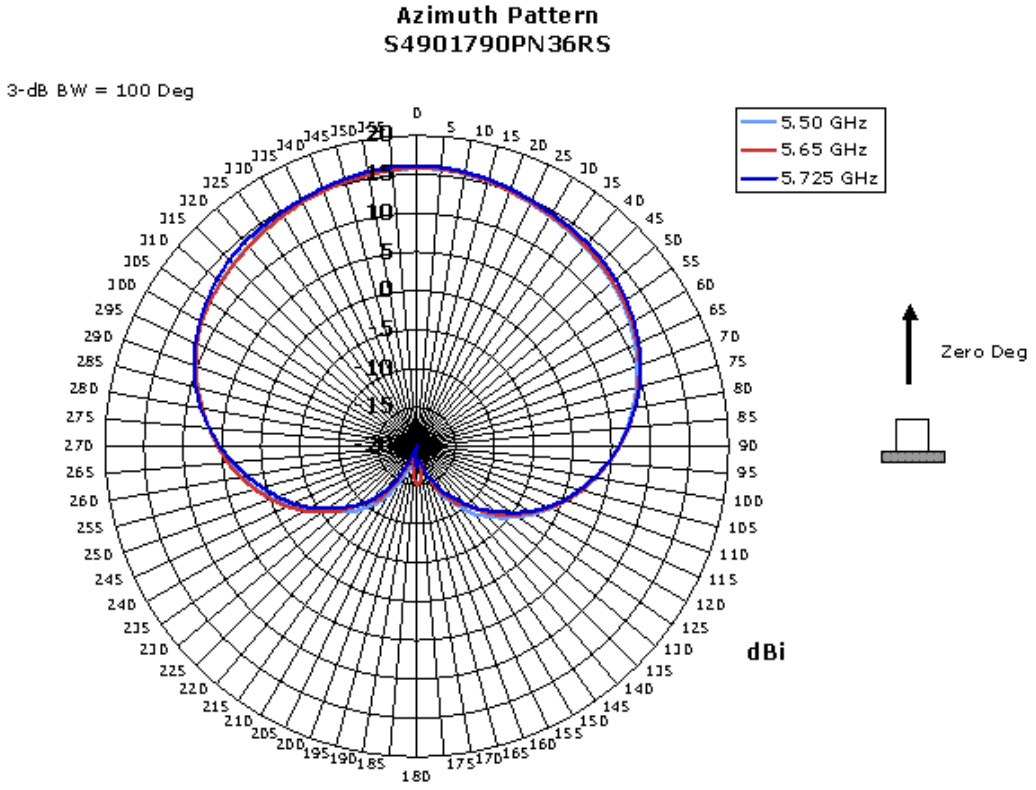
13 High-Gain Directional Panel Antenna

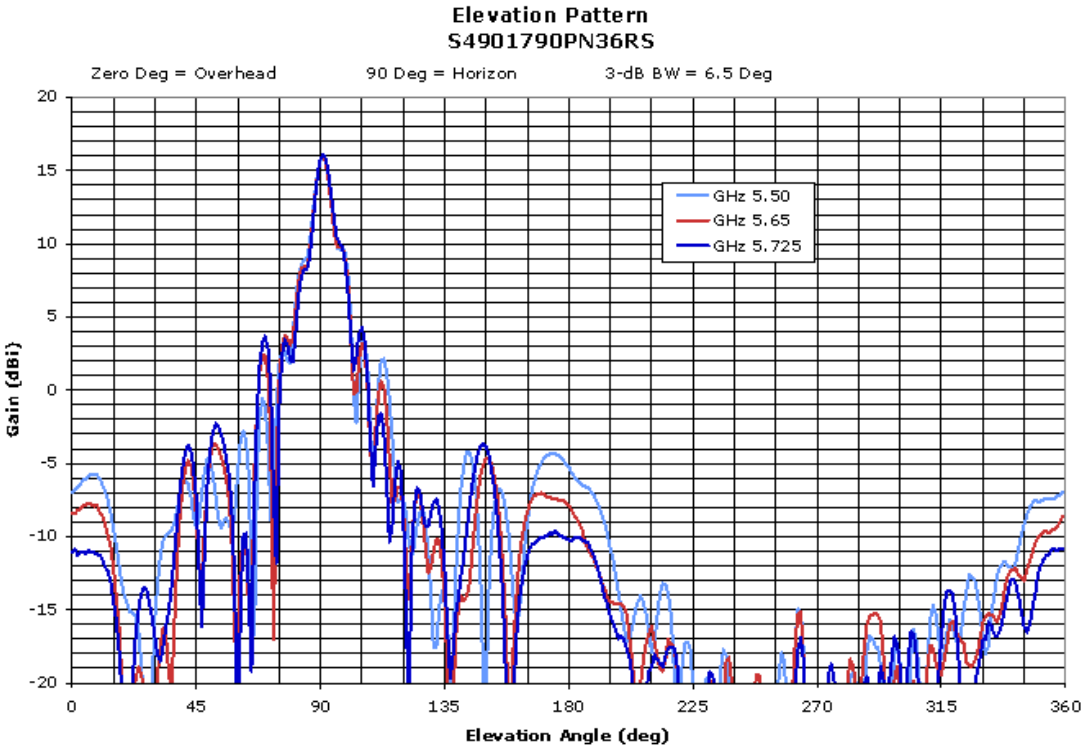
Order Number: DR4000090E6

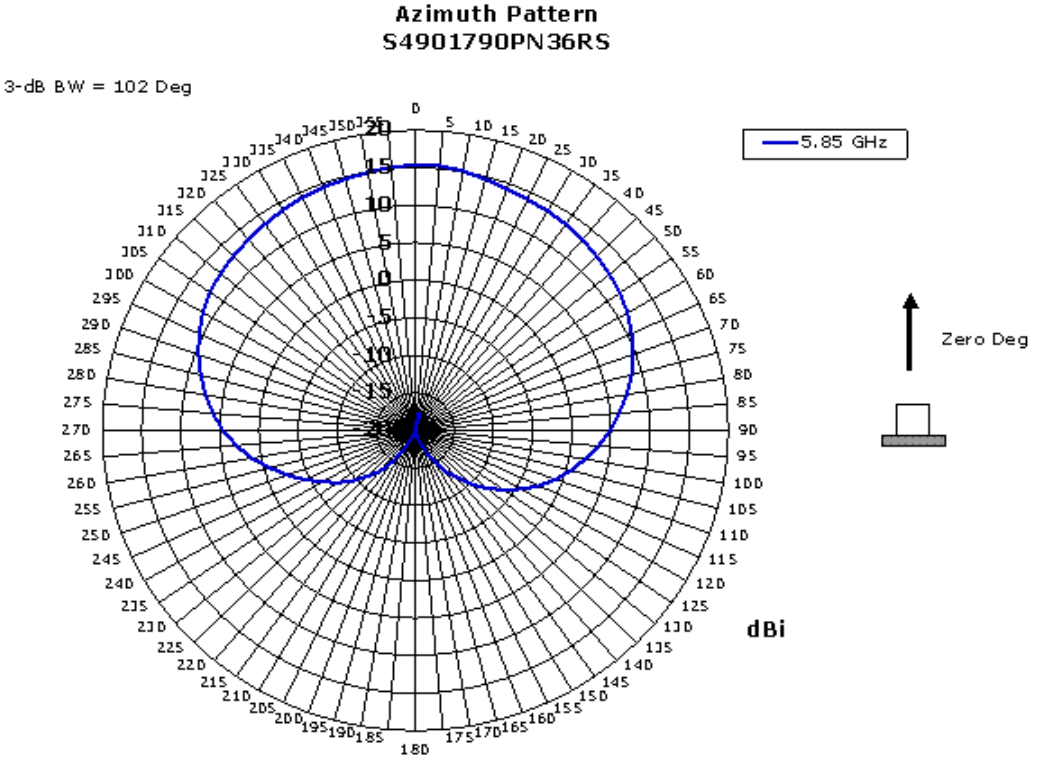
- Cushcraft Model S4901790PN36RS
- 5.15 - 5.25 GHz, 15.7 dBi Peak Gain
- 5.25 - 5.35 GHz, 15.9 dBi Peak Gain
- 5.470 - 5.725 GHz, 16.0 dBi Peak Gain
- 5.725 - 5.85 GHz, 15.8 dBi Peak Gain
- Wall or pole mounting available for 1.5" to 3.5" diameter pole giving up to 15° of down-tilt
- Symmetrical and uniform 90 degree H-plane and 5.5 degree E-plane patterns
- Measures 2.74" in diameter x 24.6" Long

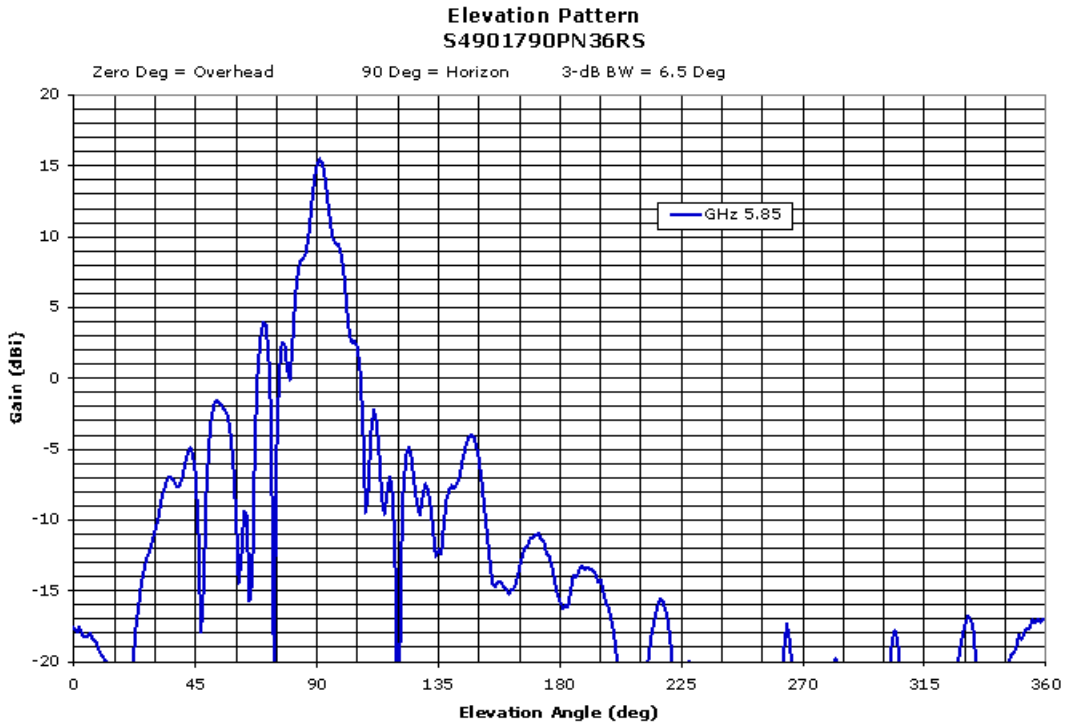

Azimuth Pattern
S4901790PN36RS
3-dB BW = 91 Deg
5.18 GHz
5.26 GHz
5.37 GHz
Zero Deg
dBi


Elevation Pattern
S4901790PN36RS
Zero Deg = Overhead
90 Deg = Horizon
3-dB BW = 6.5 Deg
GHz 5.18
GHz 5.26
GHz 5.37
Gain (dBi)
20
15
10
5
0
-5
-10
-15
-20
0
45
90
135
180
225
270
315
360
Elevation Angle (deg)


Azimuth Pattern
S4901790PN36RS
3-dB BW = 100 Deg
5.50 GHz
5.65 GHz
5.725 GHz
Zero Deg
dBi


Elevation Pattern
S4901790PN36RS
Zero Deg = Overhead
90 Deg = Horizon
3-dB BW = 6.5 Deg
GHz 5.50
GHz 5.65
GHz 5.725
Gain (dBi)
20
15
10
5
0
-5
-10
-15
-20
0
45
90
135
180
225
270
315
360
Elevation Angle (deg)

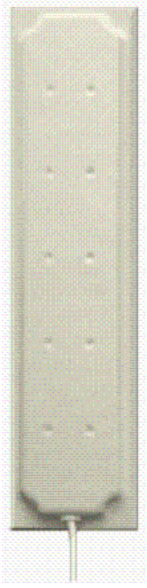

Azimuth Pattern
S4901790PN36RS
3-dB BW = 102 Deg
5.85 GHz
Zero Deg
dBi

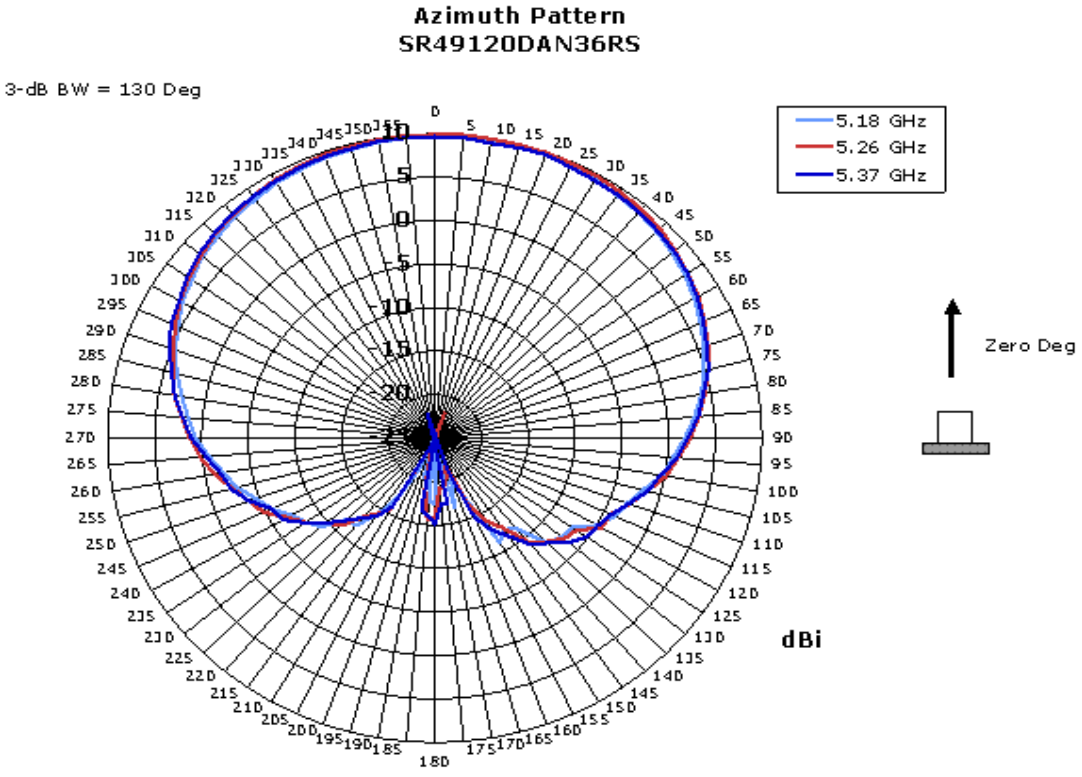

Elevation Pattern
S4901790PN36RS
Zero Deg = Overhead
90 Deg = Horizon
3-dB BW = 6.5 Deg
GHz 5.85
Gain (dBi)
20
15
10
5
0
-5
-10
-15
-20
0
45
90
135
180
225
270
315
360
Elevation Angle (deg)

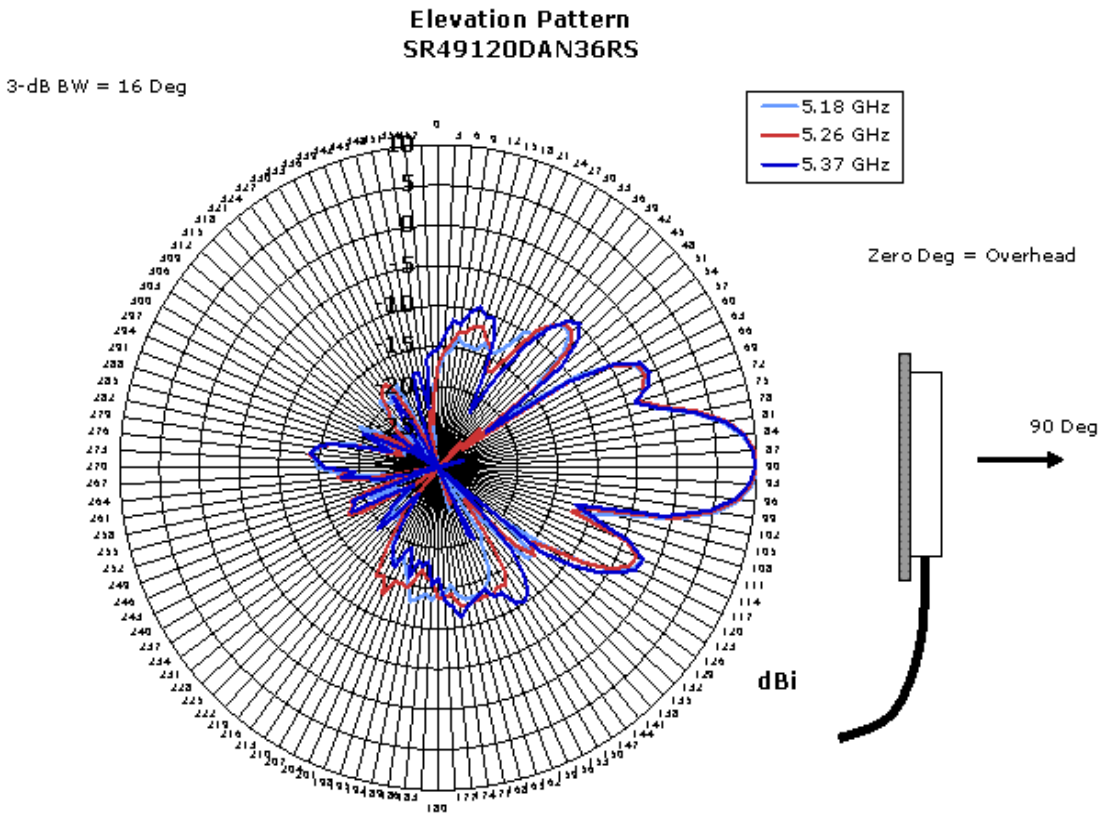
14 High-Gain Directional Panel Antenna

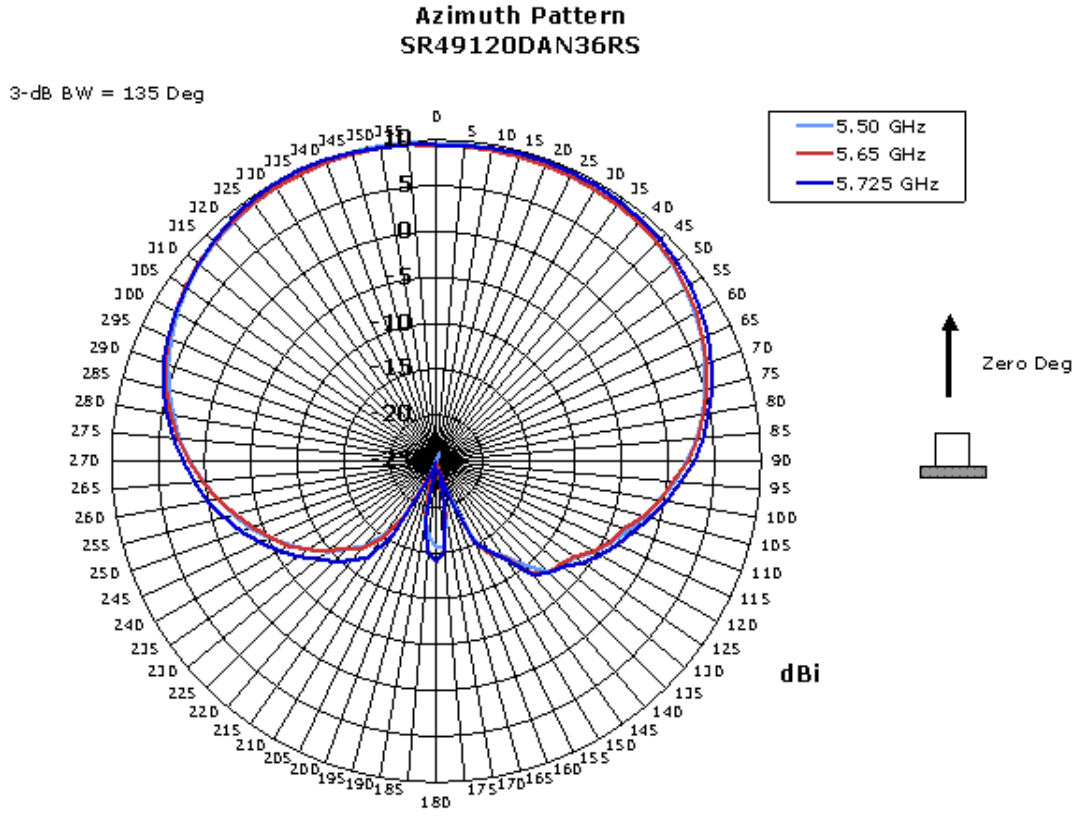
Order Number: DR4000091E6

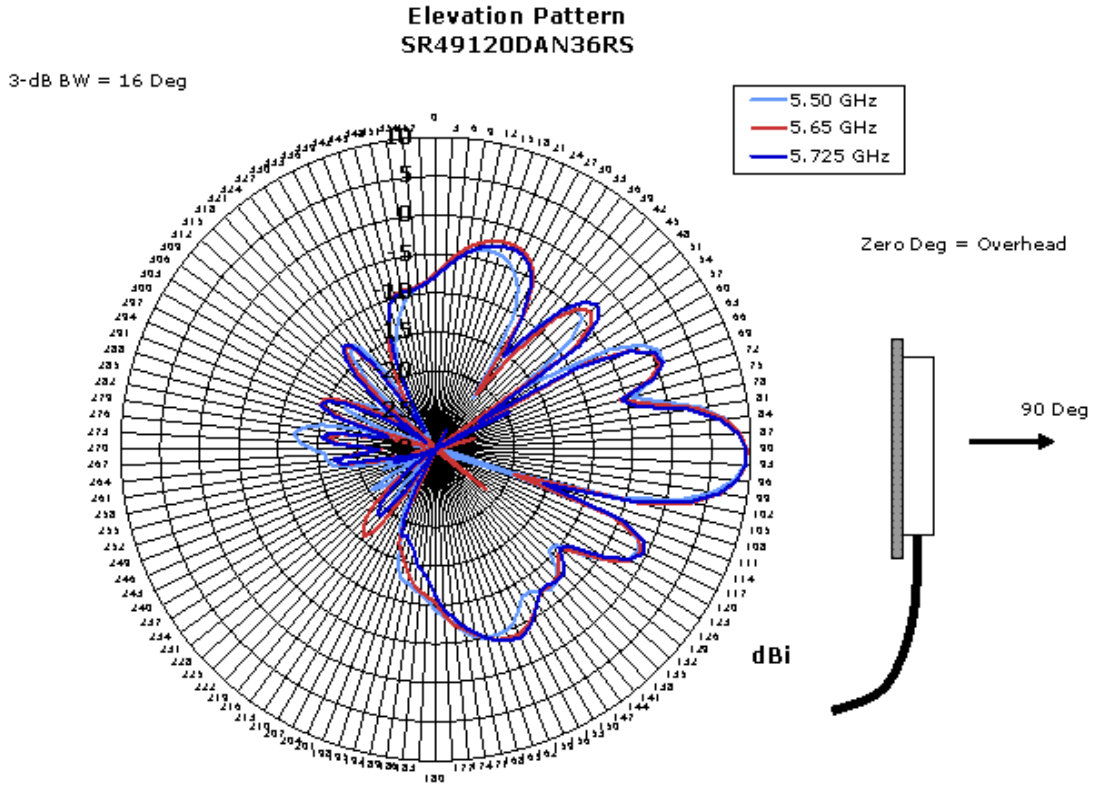
- Cushcraft Model SR49120DAN36RS
- 5.15 - 5.25 GHz, 10.0 dBi Peak Gain
- 5.25 - 5.35 GHz, 9.9 dBi Peak Gain
- 5.470 - 5.725 GHz, 9.6 dBi Peak Gain
- 5.725 - 5.85 GHz, 9.5 dBi Peak Gain
- Wall or pole mounting options available
- Symmetrical and uniform 120 degree H-plane and 15 degree E-plane patterns
- Measures 1" x 2.4" x 9.5"

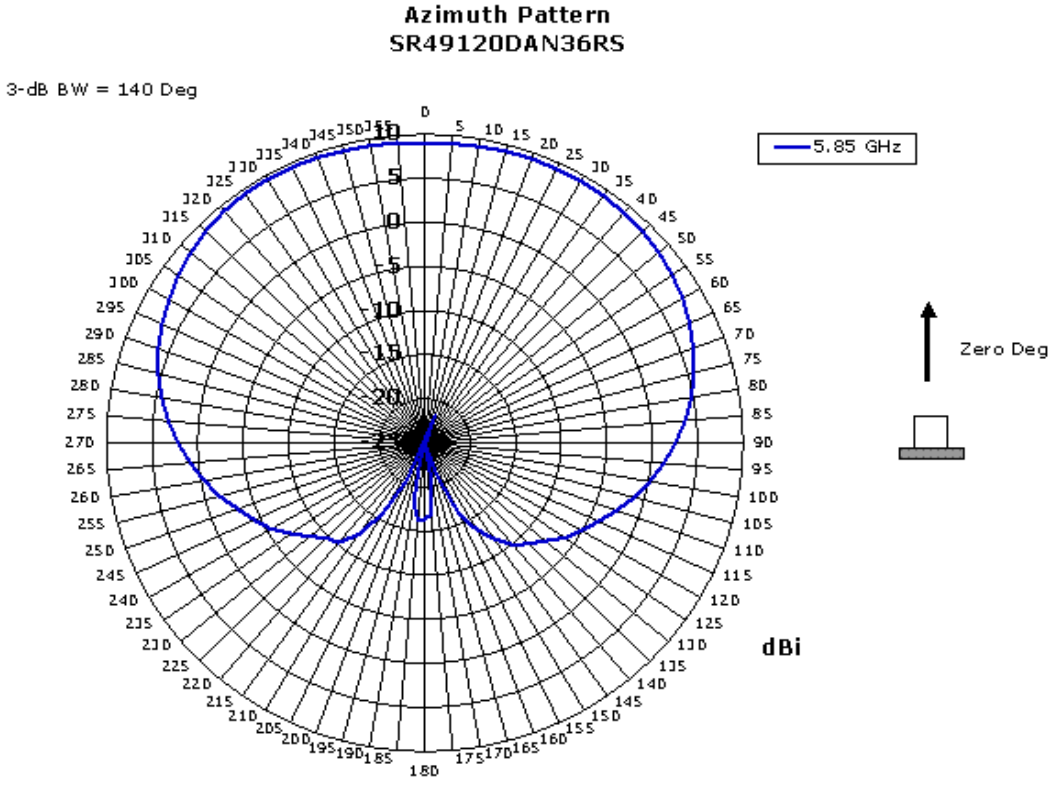


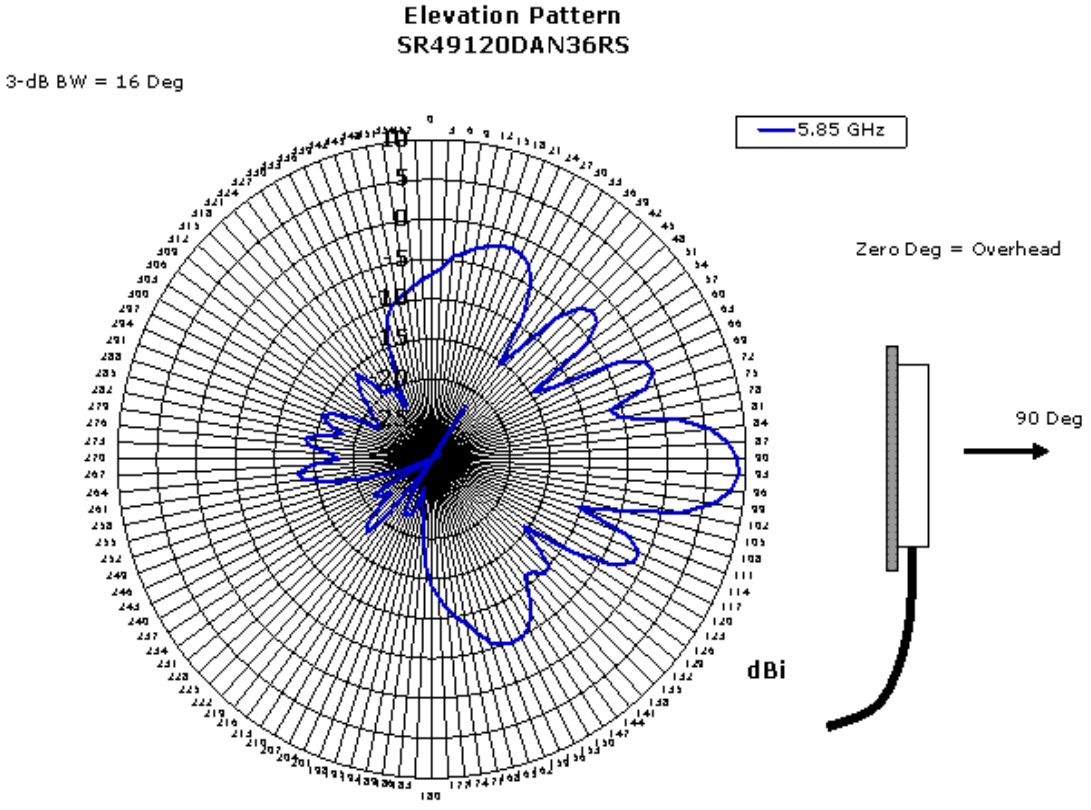

Azimuth Pattern
SR49120DAN36RS
3-dB BW = 130 Deg
5.18 GHz
5.26 GHz
5.37 GHz
Zero Deg
dBi


Elevation Pattern
SR49120DAN36RS
3-dB BW = 16 Deg
5.18 GHz
5.26 GHz
5.37 GHz
Zero Deg = Overhead
90 Deg
dBi


Azimuth Pattern
SR49120DAN36RS
3-dB BW = 135 Deg
5.50 GHz
5.65 GHz
5.725 GHz
Zero Deg
dBi


Elevation Pattern
SR49120DAN36RS
3-dB BW = 16 Deg
5.50 GHz
5.65 GHz
5.725 GHz
Zero Deg = Overhead
90 Deg
dBi


Azimuth Pattern
SR49120DAN36RS
3-dB BW = 140 Deg
5.85 GHz
Zero Deg
dBi
10
5
0
-5
-10
-15
-20



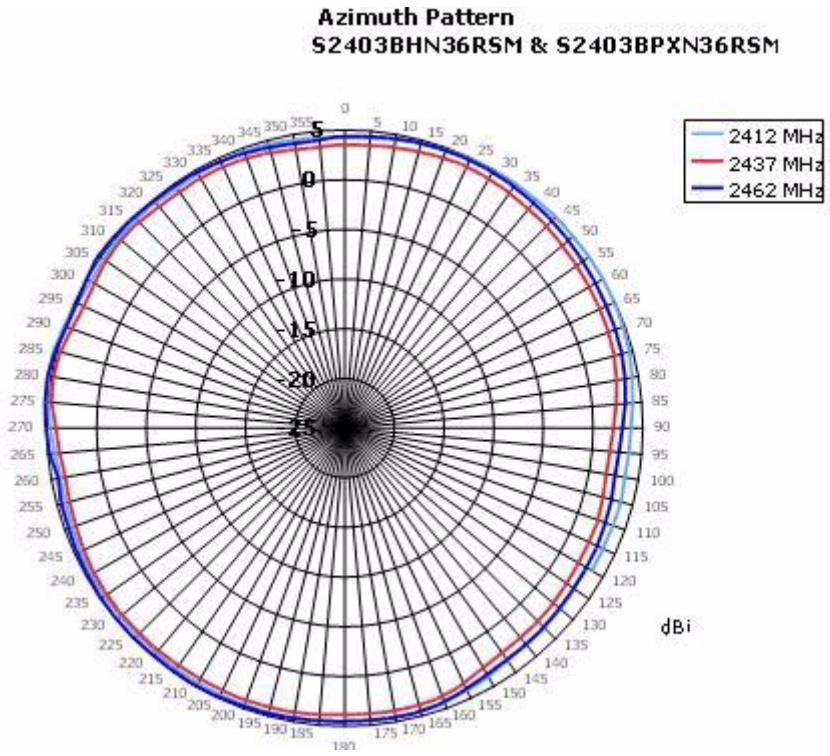
Antenna descriptions – 802.11b/g (2.4 GHz) antennas

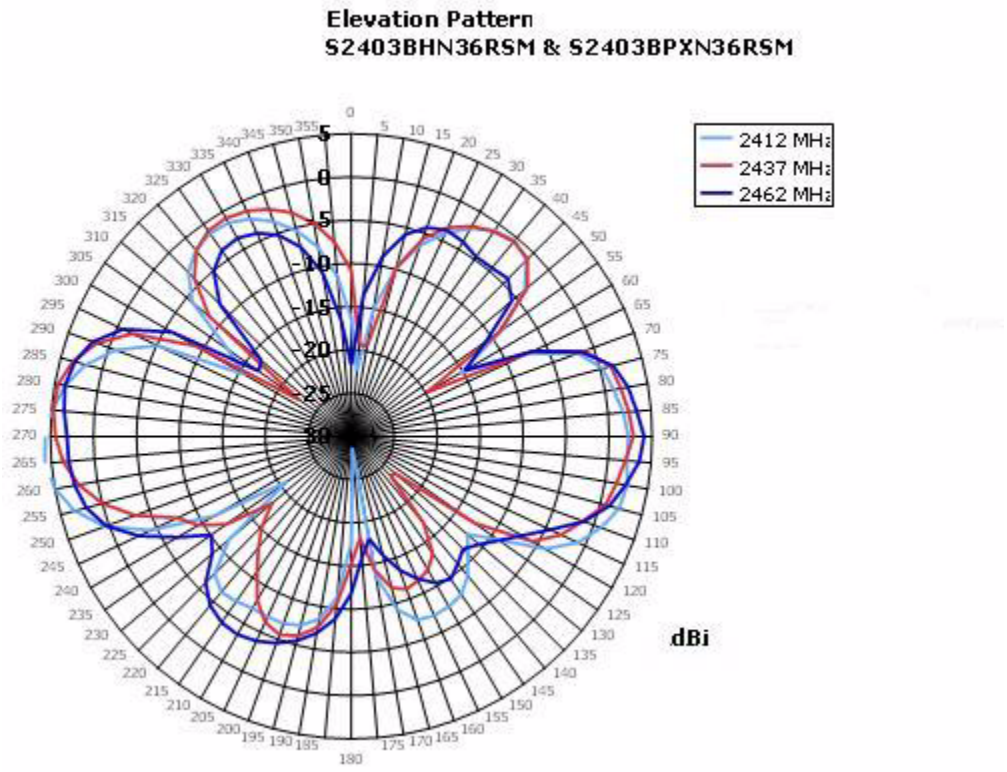
4 Omni-directional Colinear Dipole Antenna

Order Number: DR4000088E6

- Cushcraft Model S2403BPXN36RSM
- 2.4 - 2.5 GHz, 4.9 dBi Peak Gain
- Rugged housing suitable for industrial deployments
- Ideal for large open areas
- Suspended ceiling mount

- Measures 11.5” x 1”

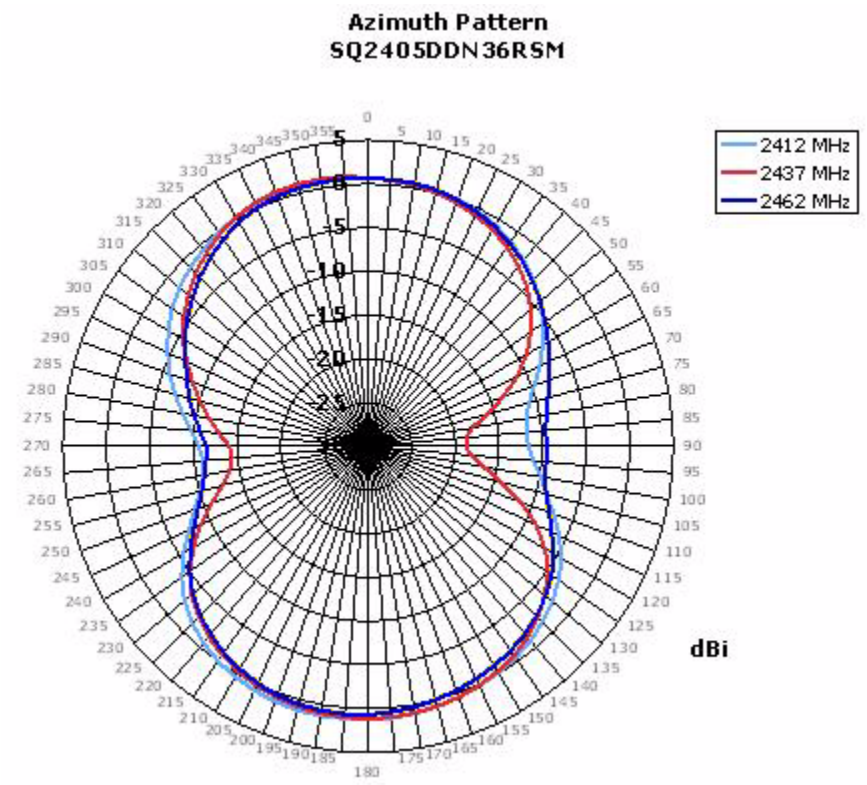

Azimuth Pattern
S2403BHN36RSM & S2403BPXN36RSM
2412 MHz
2437 MHz
2462 MHz
5
0
-5
-10
-15
-20
-25
dBi

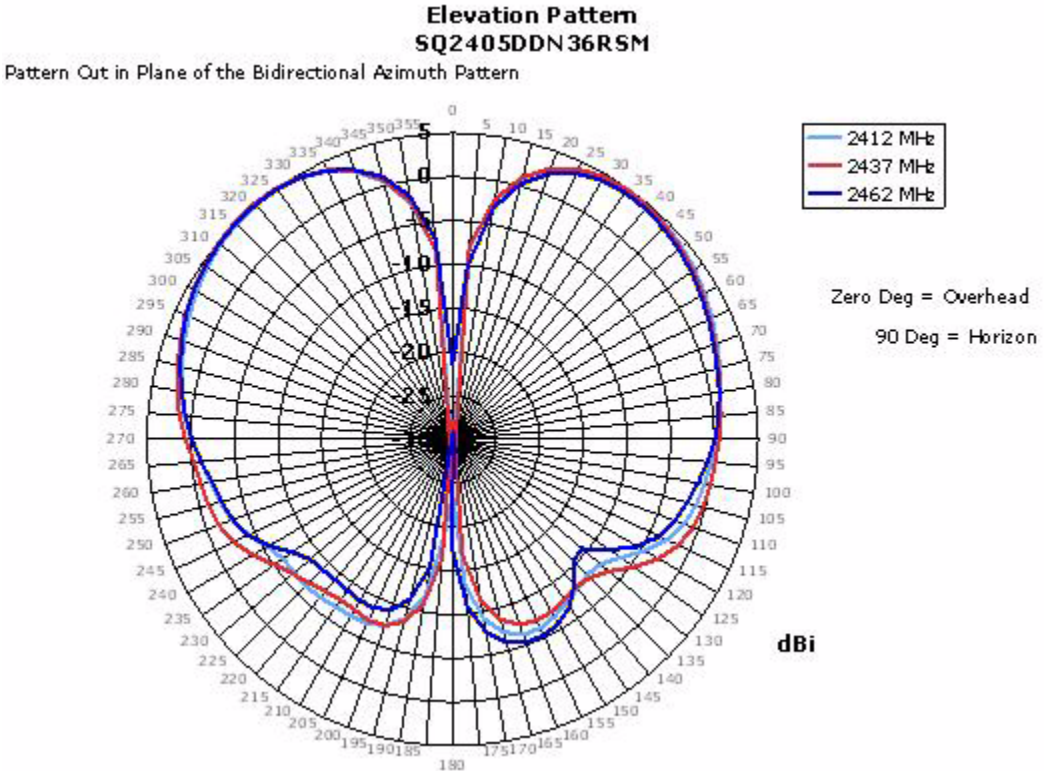

Elevation Pattern
S2403BHN36RSM & S2403BPXN36RSM
2412 MHz
2437 MHz
2462 MHz
5
0
-5
-10
-15
-20
-25
-30
dBi

5 Omni-directional Ceiling Panel Antenna

Order Number: DR4000073E6

- Cushcraft Model SQ2405DDN36RSM
- 2.4 - 2.5 GHz, 4.5 dBi Peak Gain
- Bi-directional, low profile ceiling antenna
- Paintable with light, non-metallic coating for custom color matching
- 3-foot cable
- Measures 6.12” x 6.12” x 1.25”

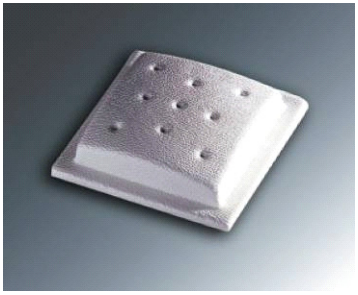

Azimuth Pattern
SQ2405DDN36RSM
2412 MHz
2437 MHz
2462 MHz
dBi

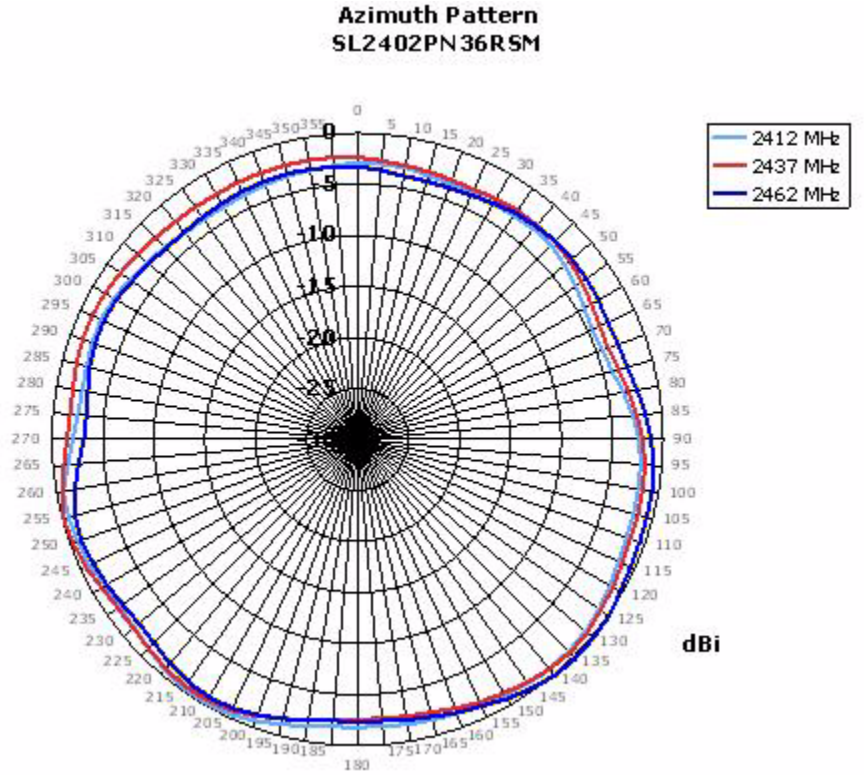

Elevation Pattern
SQ2405DDN36RSM
Pattern Out in Plane of the Bidirectional Azimuth Pattern
2412 MHz
2437 MHz
2462 MHz
Zero Deg = Overhead
90 Deg = Horizon
dBi

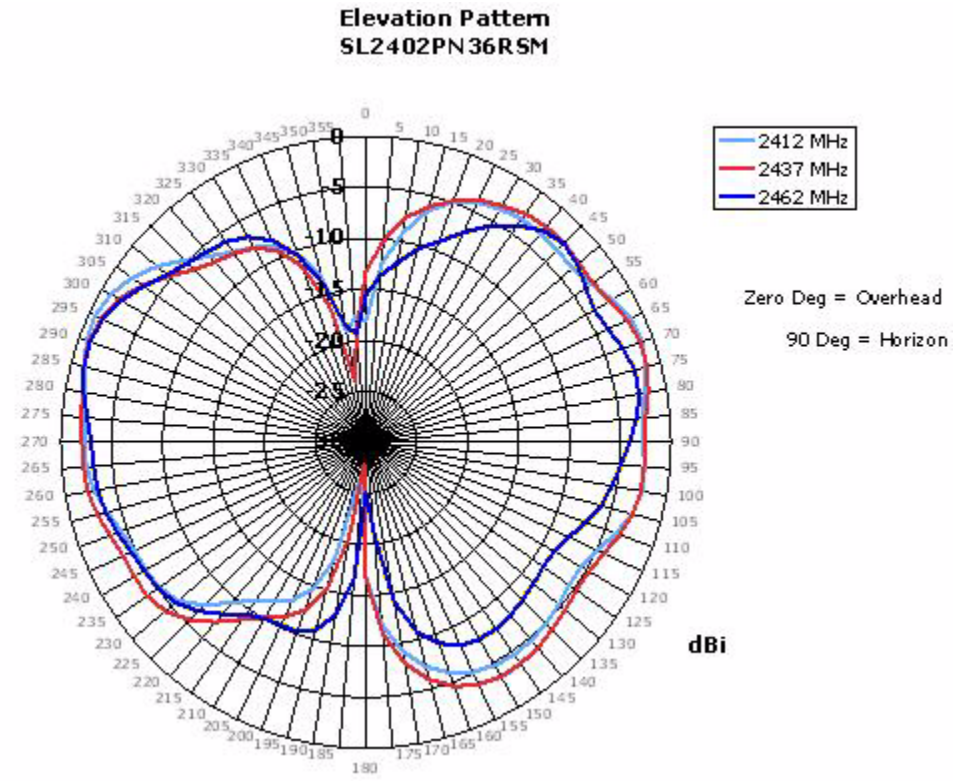
6 Omni-directional Ceiling Panel Antenna

Order Number: DR4000074E6

- Cushcraft Model SL2402PN36RSM
- 2.4 - 2.5 GHz, 0.0 dBi Peak Gain
- Very uniform and symmetrical antenna pattern
- Well-suited for high-density deployments
- 3-foot cable
- Measures only 2” x 2” x 0.7”



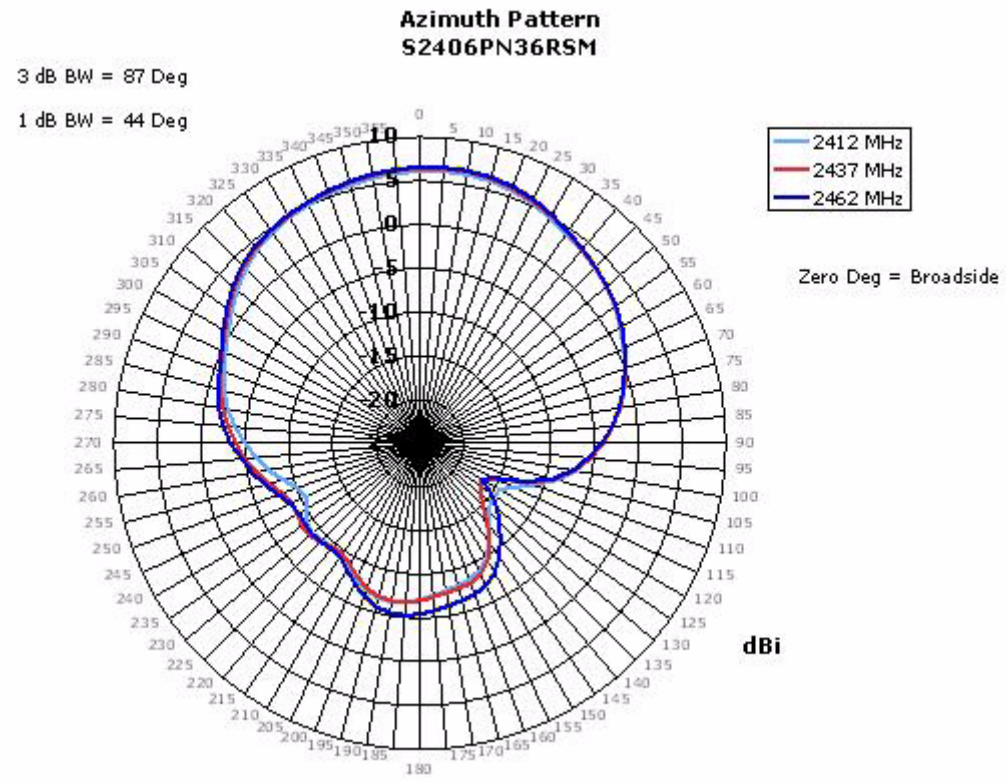

Azimuth Pattern
SL2402PN36RSM
2412 MHz
2437 MHz
2462 MHz
dBi

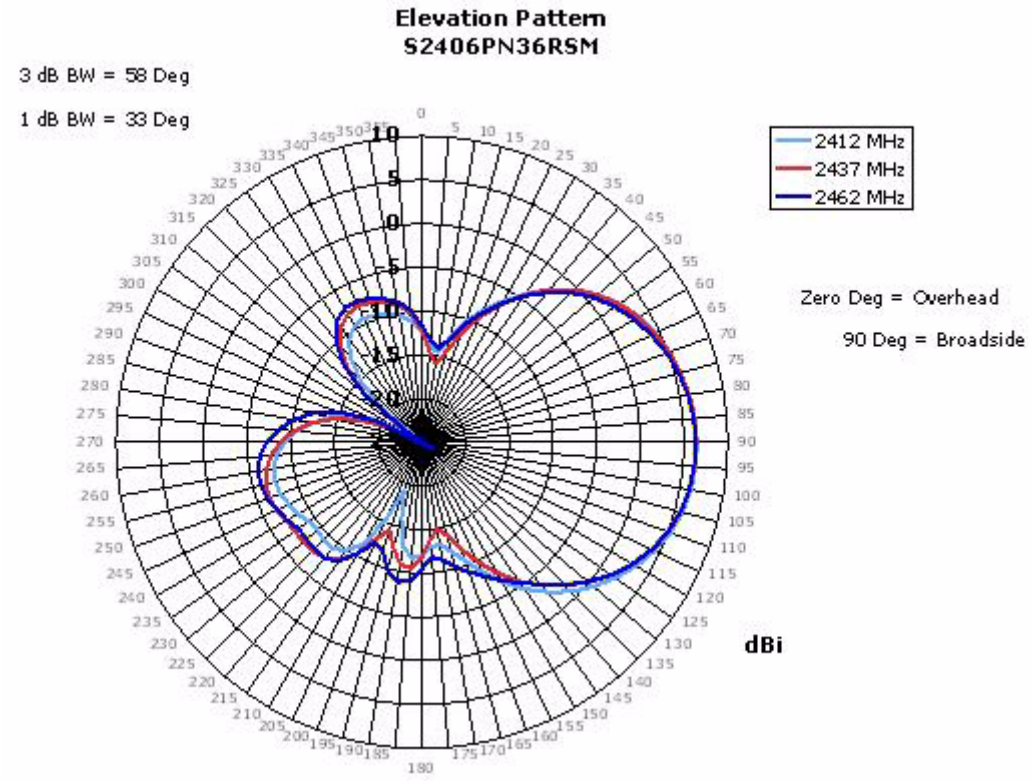

Elevation Pattern
SL2402PN36RSM
2412 MHz
2437 MHz
2462 MHz
Zero Deg = Overhead
90 Deg = Horizon
dBi

7 Directional Panel Antenna

Order Number: DR4000075E6

- Cushcraft Model S2406PN36RSM
- 2.4 - 2.5 GHz, 6.5 dBi Peak Gain
- Well-suited for wall mounted applications
- Good for hallways and corridors
- Easy to disguise or hide
- 3-foot cable
- Measures only 5.2” x 3.8” x 0.5”

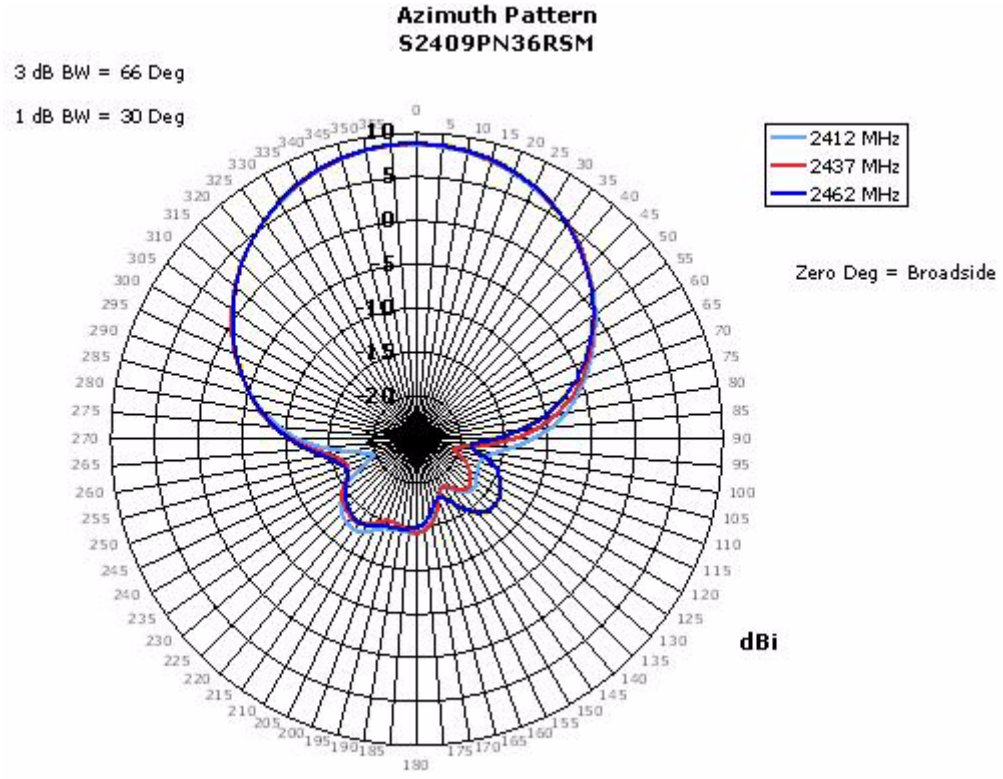

Azimuth Pattern
S2406PN36RSM
3 dB BW = 87 Deg
1 dB BW = 44 Deg
2412 MHz
2437 MHz
2462 MHz
Zero Deg = Broadside
dBi

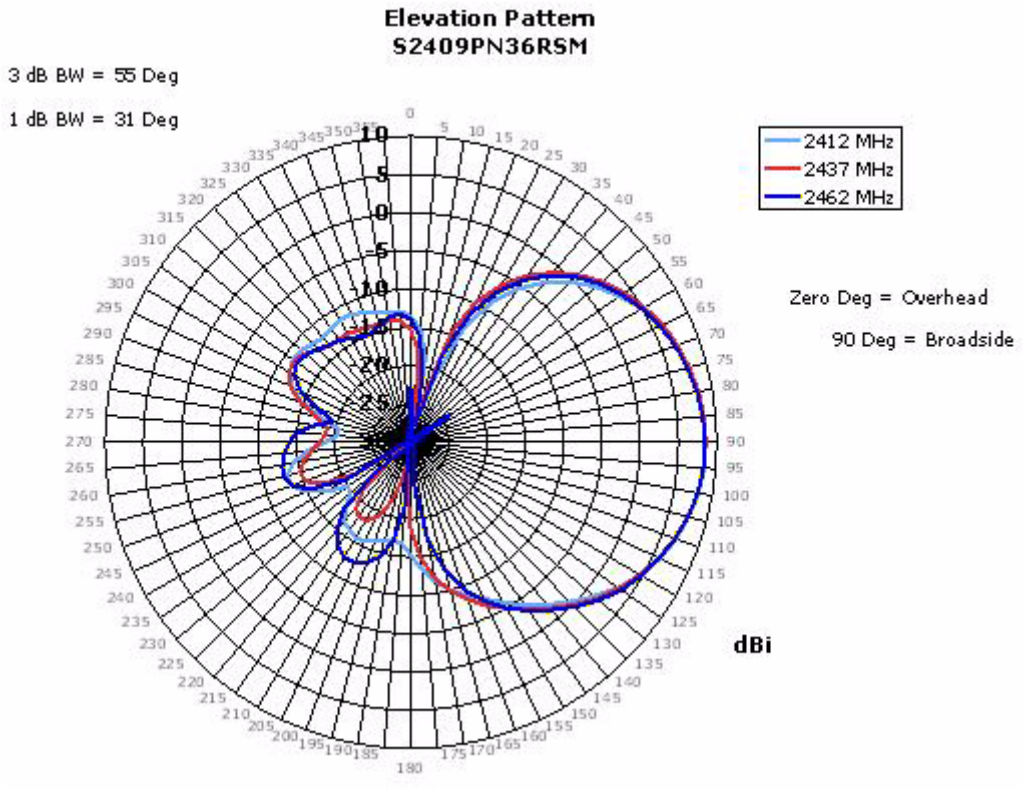

Elevation Pattern
S2406PN36RSM
3 dB BW = 58 Deg
1 dB BW = 33 Deg
2412 MHz
2437 MHz
2462 MHz
Zero Deg = Overhead
90 Deg = Broadside
dBi

8 Directional Panel Antenna

Order Number: DR4000076E6

- Cushcraft Model S2409PN36RSM
- 2.4 - 2.5 GHz, 8.8 dBi Peak Gain
- Well-suited for wall mounted applications
- Good for hallways and corridors where multi-path and scattering can be a problem
- 3-foot cable
- Measures only 6” x 6” x 1.25”

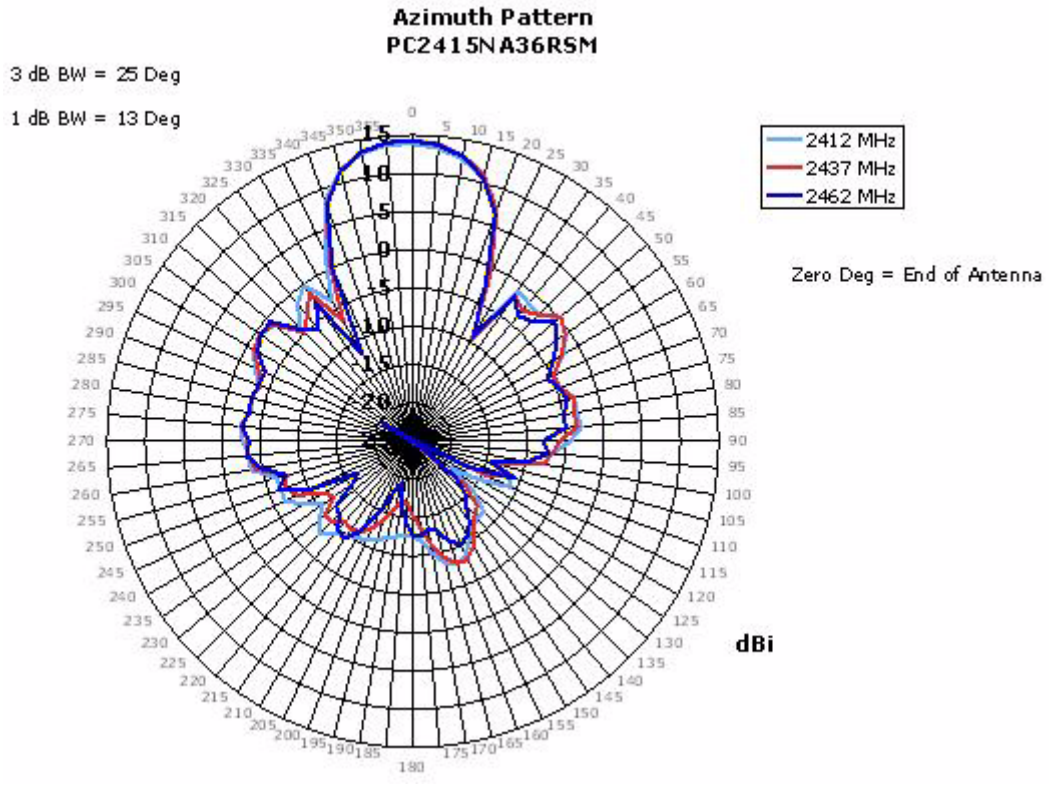

Azimuth Pattern
S2409PN36RSM
3 dB BW = 66 Deg
1 dB BW = 30 Deg
2412 MHz
2437 MHz
2462 MHz
Zero Deg = Broadside
dBi

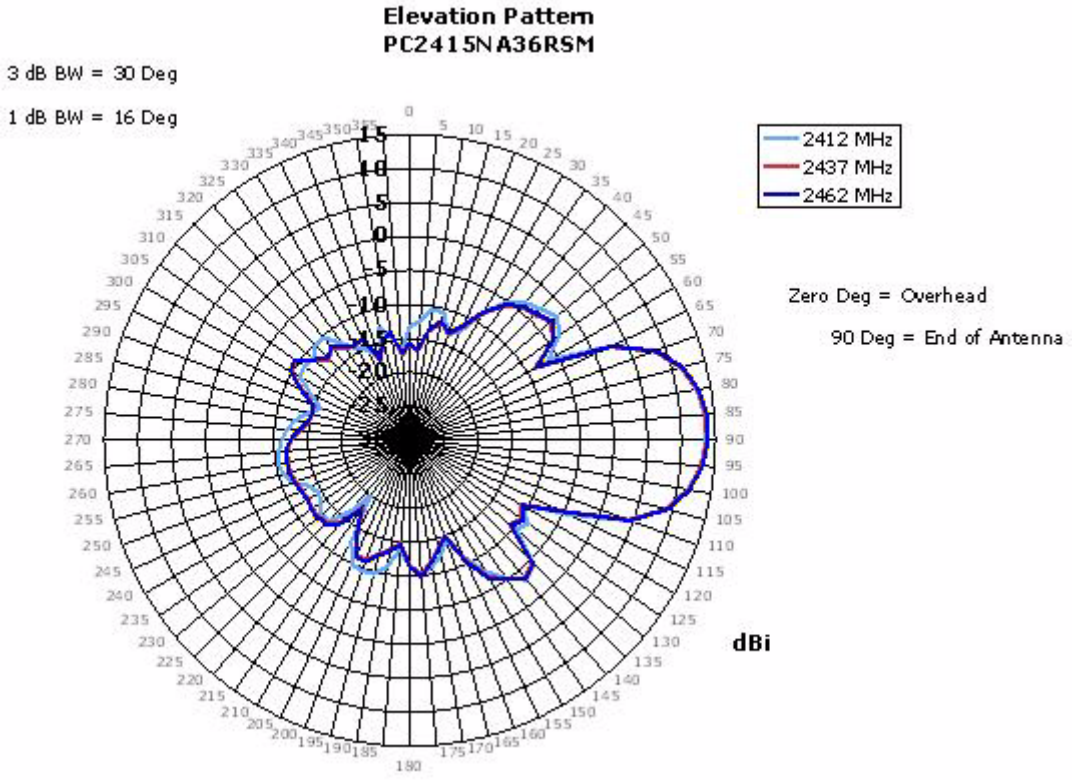

Elevation Pattern
S2409PN36RSM
3 dB BW = 55 Deg
1 dB BW = 31 Deg
2412 MHz
2437 MHz
2462 MHz
Zero Deg = Overhead
90 Deg = Broadside
dBi

9 Directional Yagi Antenna

Order Number: DR4000077E6

- Cushcraft Model PC2415NA36RSM
- 2.4 - 2.5 GHz, 14.1 dBi Peak Gain
- Articulating mount for precise direction pointing
- Good for long and narrow zones like tunnels
- 3-foot cable
- Measures 26.5” x 3.75” x 1.5”

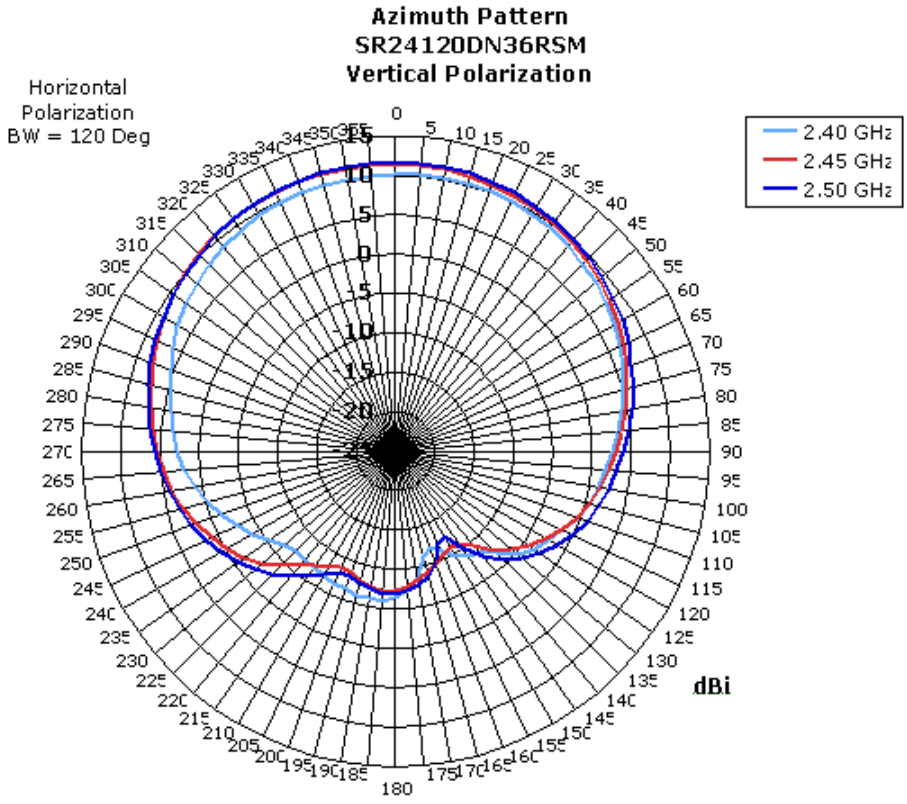

Azimuth Pattern
PC2415NA36RSM
3 dB BW = 25 Deg
1 dB BW = 13 Deg
2412 MHz
2437 MHz
2462 MHz
Zero Deg = End of Antenna
dBi

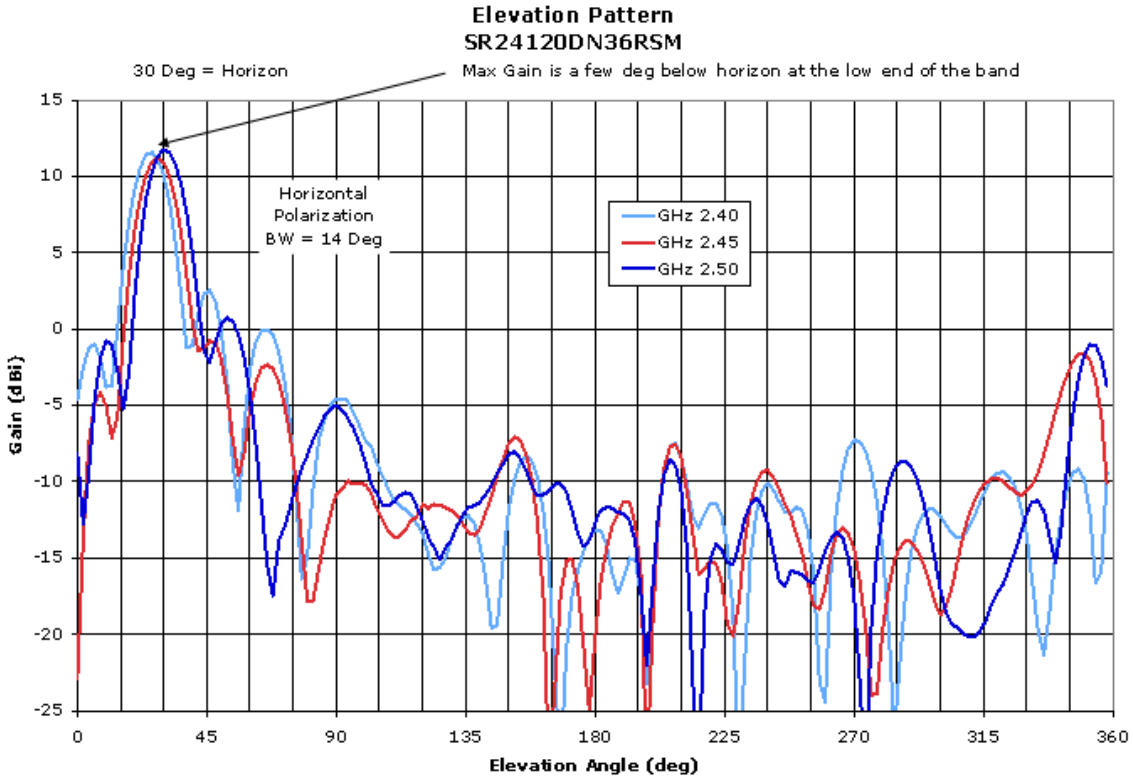

Elevation Pattern
PC2415NA36RSM
3 dB BW = 30 Deg
1 dB BW = 16 Deg
2412 MHz
2437 MHz
2462 MHz
Zero Deg = Overhead
90 Deg = End of Antenna
dBi

10 Directional Patch Panel Antenna

Order Number: DR4000087E6

- Cushcraft Model SR24120DN36RSM
- 2.4 - 2.5 GHz, 11 dBi Peak Gain
- Uniform 120 degree H-plane and 14 degree E-plane pattern
- Wall or pole mounting options available
- Designed for long, wide coverage environments
- 3-foot cable
- Measures 23" x 3" x 2"

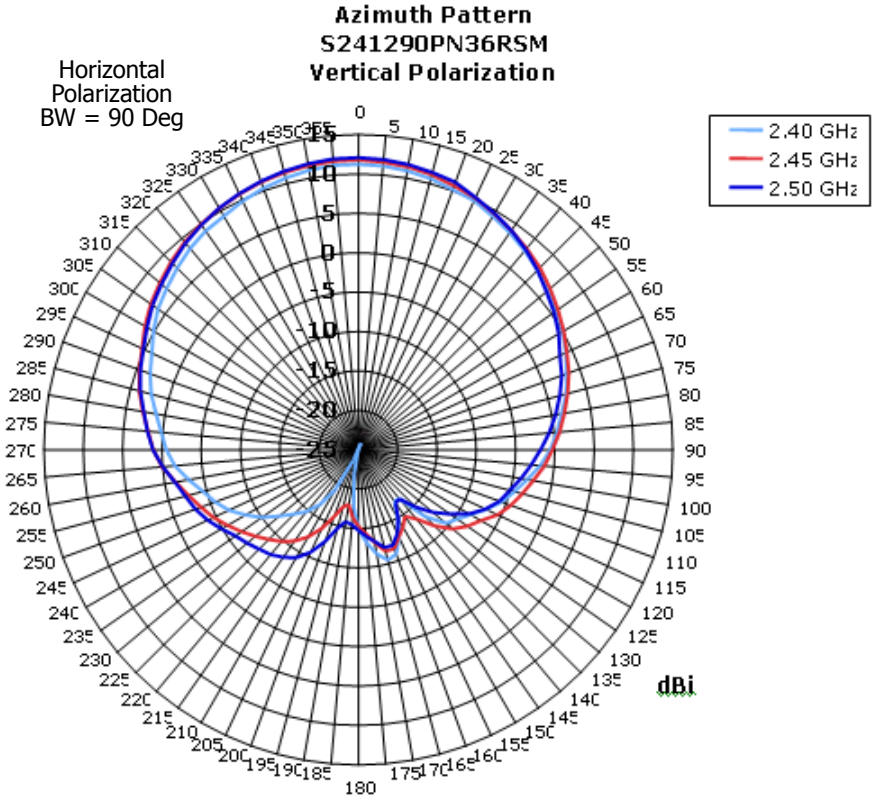

Azimuth Pattern
SR24120DN36RSM
Vertical Polarization
Horizontal
Polarization
BW = 120 Deg
2.40 GHz
2.45 GHz
2.50 GHz
dBi

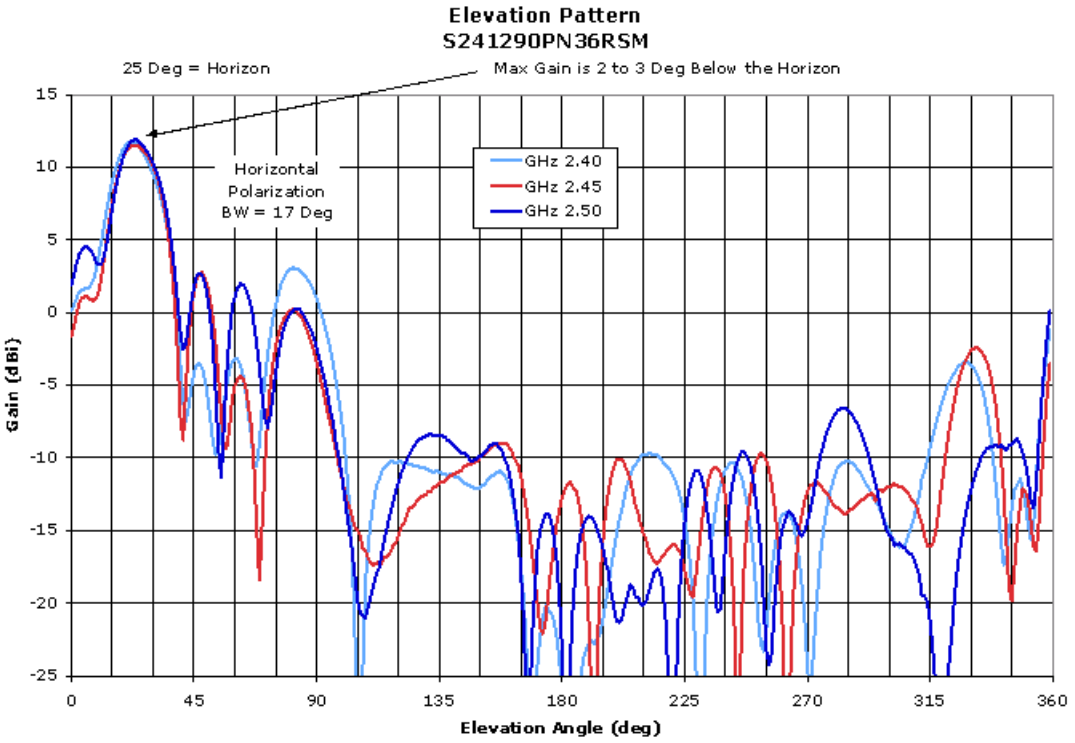

Elevation Pattern
SR24120DN36RSM
30 Deg = Horizon
Max Gain is a few deg below horizon at the low end of the band
Horizontal
Polarization
BW = 14 Deg
GHz 2.40
GHz 2.45
GHz 2.50
Gain (dBi)
15
10
5
0
-5
-10
-15
-20
-25
0
45
90
135
180
225
270
315
360
Elevation Angle (deg)

11 Directional Patch Panel Antenna

Order Number: DR4000086E6

- Cushcraft Model S241290PN36RSM
- 2.4 - 2.5 GHz, 12 dBi Peak Gain
- Uniform 90 degree H-plane and 17 degree E-plane pattern
- Tilt-mount available for precise direction pointing(shown)
- Designed for long, wide coverage environments
- 3-foot cable
- Measures 26" x 3" x 1"


Azimuth Pattern
S241290PN36RSM
Vertical Polarization
Horizontal
Polarization
BW = 90 Deg
2.40 GHz
2.45 GHz
2.50 GHz
dBi



2.4/5.0 GHz Dual antenna

12 Dual-band, Tri-mode 802.11a/b/g Spatial Diversity Antenna

Order Number: DR4000078E6

- Cushcraft Model S24493DSN36RSM
- 2.4 - 2.5 GHz, 3.0 dBi Peak Gain
- 4.90 - 5.15 GHz, 4.0 dBi Peak Gain
- 5.15 - 5.25 GHz, 3.9 dBi Peak Gain

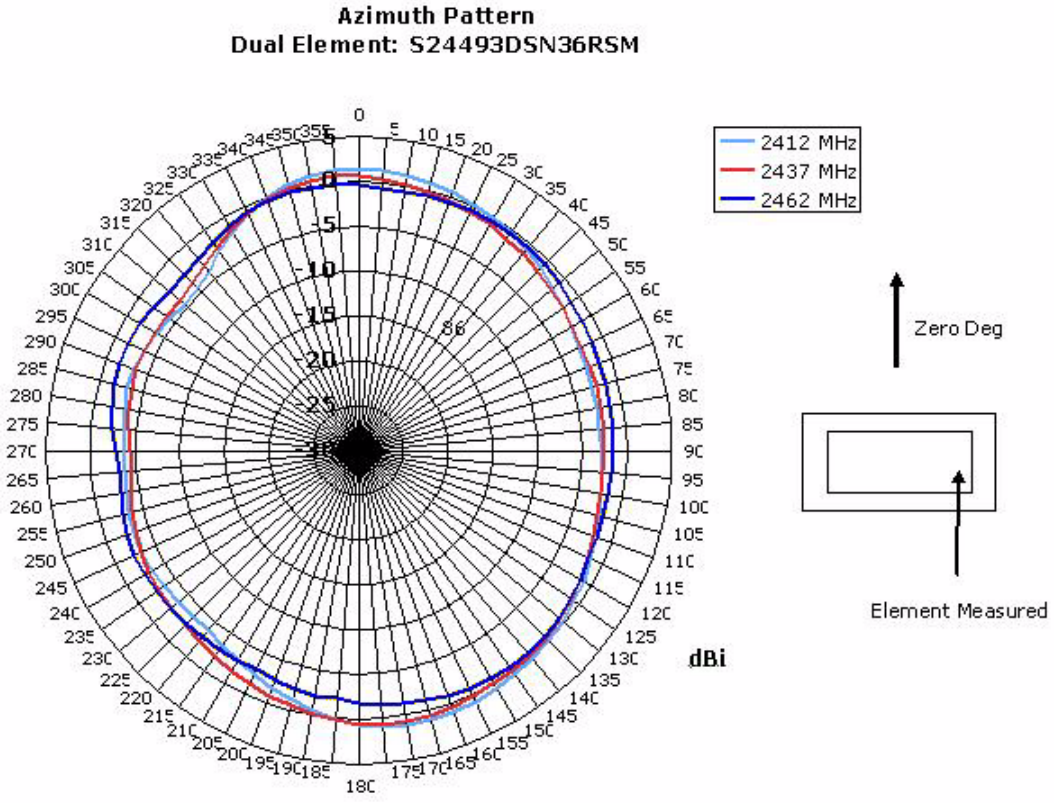
5.25 - 5.35 GHz, 3.2 dBi Peak Gain

5.470 - 5.725 GHz, 2.9 dBi Peak Gain

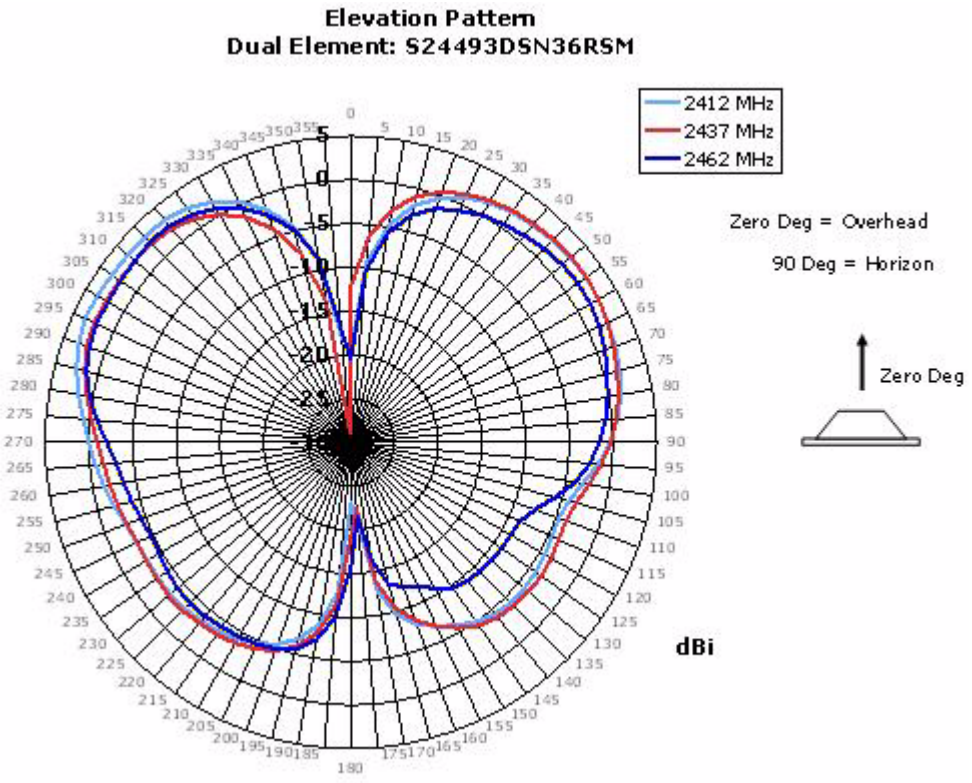
5.725 - 5.85 GHz, 2.6 dBi Peak Gain

- Each antenna port can be used individually for simultaneous 802.11a and 802.11b/g
- Well-suited for high data rate office applications
- 3-foot cable
- Measures 6.16” x .89” x 3.66”

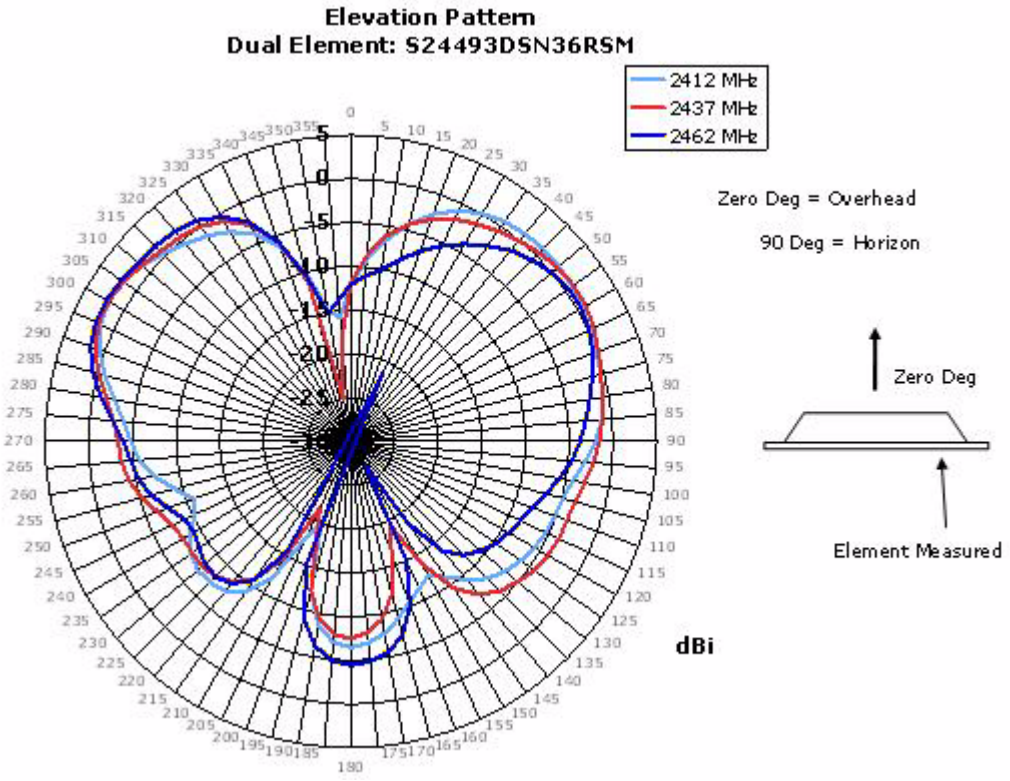
Azimuth Pattern for 2.4 GHz



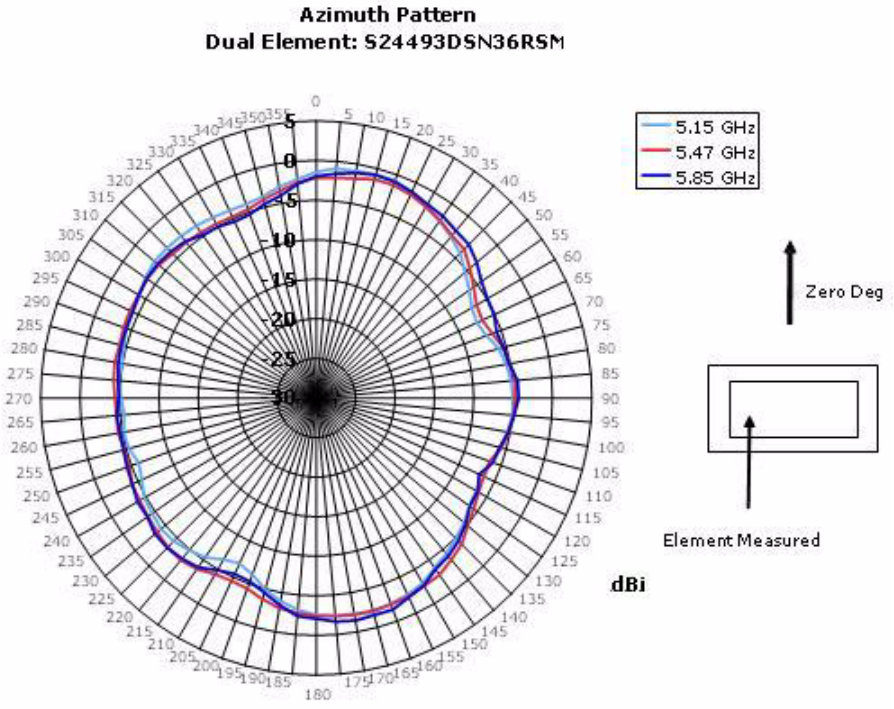
Elevation Pattern 1 for 2.4 GHz



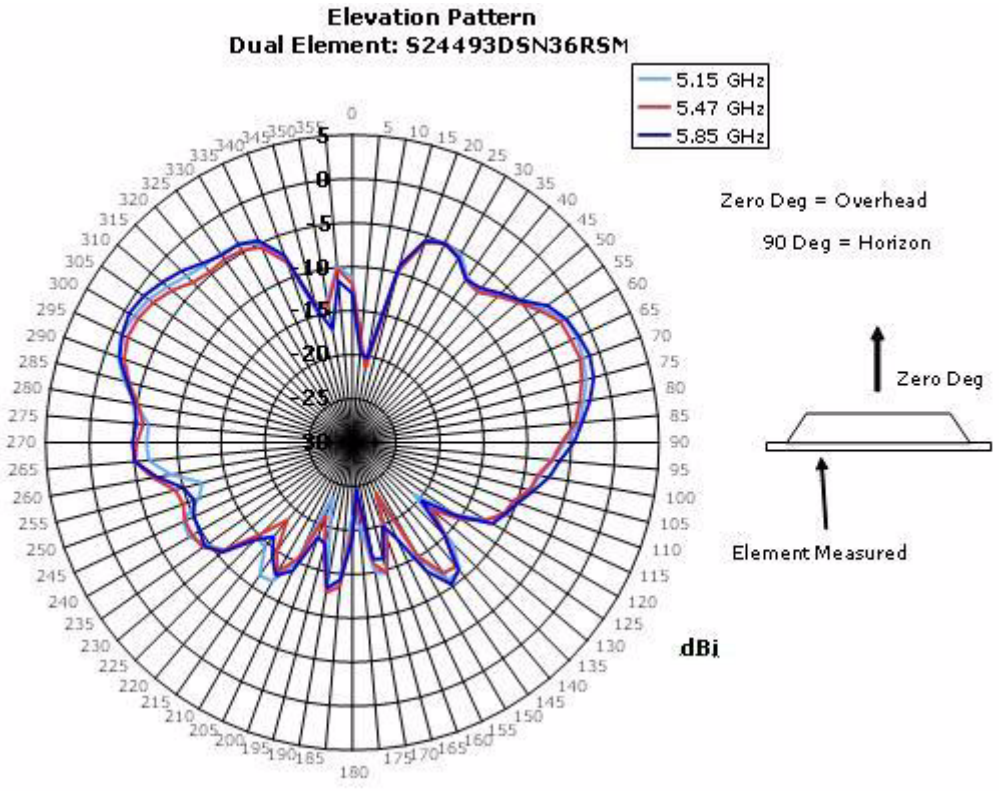
Elevation Pattern 2 for 2.4 GHz



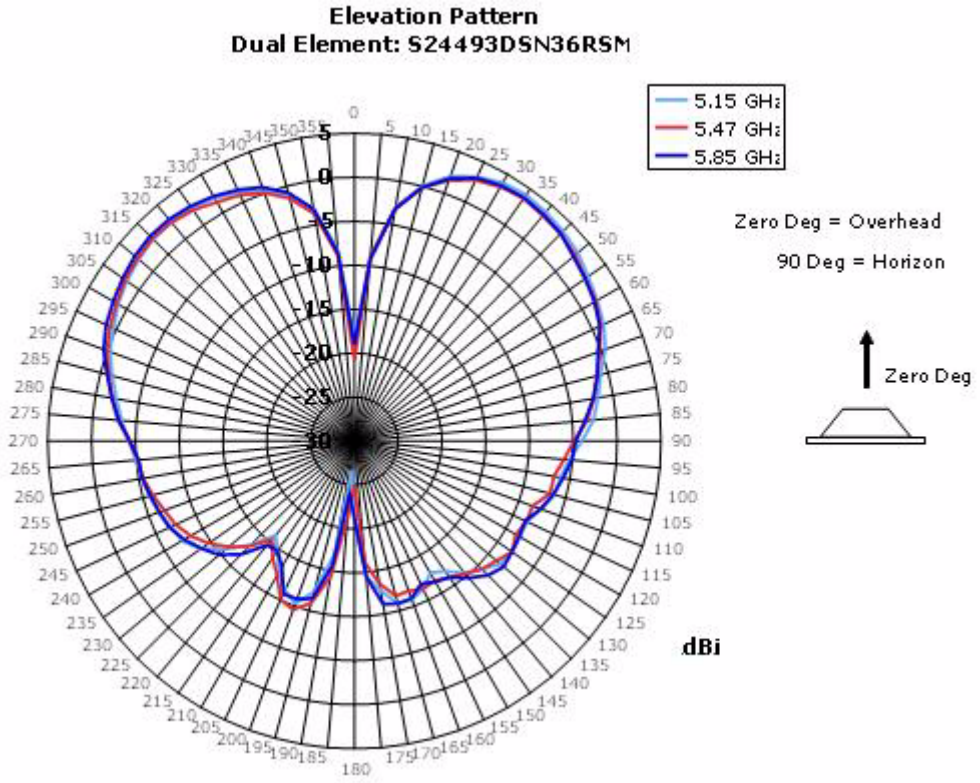
Azimuth Pattern for 5.0 GHz



Elevation Pattern 1 for 5.0 GHz



Elevation Pattern 2 for 5.0 GHz



Glossary of common antenna terminology

The following glossary includes basic antenna terminology that can help in the selection and/or recommendation of a particular antenna. These terms are used throughout the remainder of the document:

Omnidirectional (Omni) – Refers to the antenna coverage pattern. An omnidirectional antenna creates a uniform coverage pattern. Most omnidirectional antennas are weakest directly above and directly below their endpoints – this characteristic creates the familiar dual-lobe pattern shown on the E-plane graphs. Nulls are typically related to the orientation of the dipole/monopole antenna relative to the horizontal or vertical planes. The lobes grow and shrink depending upon the ground plane effects and cancellation/addition of the radiating signal. Omnidirectional antennas are suitable for most general deployments.

Directional – Refers to the antenna coverage pattern. A directional antenna focuses its lobe or radiated energy in a particular direction. In general, as the gain of a directional antenna increases, the radiating beamwidth or lobe decreases. This design increases the transmitted power and communication distance in a specific direction at the expense of uniform coverage, as compared to an omnidirectional antenna. A directional antenna must be "aimed" at the intended coverage zone.

Gain – Expressed in dBi, indicates the relative increase in radiated power over an isotropic point radiating source with a reference gain of 1.0.

Each 3 dB increment in power effectively doubles the radiated energy. For example, an antenna with a gain of 9 dBi increases the transmit power 8 times more than an isotropic point radiating source. For example:

12.5 mW = 11 dBm

11 dBm + 9dBi = 20 dBm

20 dBm = 100 mW

100mw/12.5 mW = 8 times more power

E-Plane graph – The elevation plane graph shows the radiated antenna coverage pattern as a vertical cross section - as if looking directly at the antenna from the side.

H-Plane graph – The horizontal plane graph shows the radiated antenna coverage pattern as a horizontal cross section - as if looking directly at the antenna from above.

AP troubleshooting

After you insert the Cat-5 cable into an AP's port connector and enable PoE on the cable, observe the device's health or LINK LED to determine the status of the connection with the WSS.

- If the LED is green and is glowing steadily, the AP was booted successfully by the WSS and is ready for operation.
- If the LED is not steadily glowing green, see Table 5.

(For descriptions of all the LEDs, see "Status LEDs" on page 25.)

Table 5. Health LED States (Series 2332 Access Points)

Health or LINK LED Appearance	Diagnosis	Remedy
Not solid green	AP radio needs to be enabled.	Enable at least one of the radios. If the LED is still not solid green, try the remedy listed in this table based on the LED's appearance.
Unlit	AP is not receiving power.	Check the Cat-5 cable connection(s). For a direct connection to a WSS: • Set the port type on the WSS to an AP port. • Verify that Power over Ethernet (PoE) is enabled on the WSS port connected to the AP. For an indirect connection through the network: • Configure a AP connection on a WSS. • Verify that an Avaya-approved PoE source is supplying power to the AP.

Table 5. Health LED States (Series 2332 Access Points) (continued)

Health or LINK LED Appearance	Diagnosis	Remedy
Slowly alternating green and amber	AP is booting with an image received from a WSS.	Wait a few seconds for the boot process to complete. If this LED appearance persists, enable a radio or place a radio in sentry mode.
Solid amber	AP is waiting to receive boot instructions and a configuration file from a WSS.	Wait a few seconds for the boot process to begin. If the LED remains amber, try the remedies for the other health LED appearances. If the LED still remains amber, make sure the AP is securely connected to its PoE source and to the network or WSS.

AP technical specifications

This appendix lists the technical specifications for the Avaya Series 2332 access points. Table 6 lists the mechanical and compliance specifications. Table 7 on page 129, Table 8 on page 129, and Table 9 on page 130 list the radio specifications. Table 10 on page 131 lists the MAC address allocation scheme.

(For specifications for the WSS, see the *Avaya WLAN-Security Switch 2300 Series Configuration Guide*.)

Note. The Series 2332 access points are designed and approved to be used only with Avaya WLAN—Security Switch (WSS) models 2360/2361, and 2350. (The 2380 and 2382 do not directly connect to the AP.)

Note. The AP radios are disabled by default and can be enabled only by the system administrator using the WLAN Management software application or the WSS's command-line interface (CLI).

Note. The radio frequency band, operating channels, and transmit power depend on the country of operation specified by the system administrator using WLAN Management software or the WSS's CLI. In addition, the Series 2332 access points are region locked to only operate in their approved regulatory domain. If the country of operation entered into the switch does not match the region loaded into the AP at manufacture, the AP will not operate.

Table 6. AP Mechanical and Compliance Specifications

Specification	Description
Size	Diameter: 16.76 cm (6.6 inches) Height: 6.1 cm (2.4 inches)
Weight	Without mounting bracket: 0.45 kg (16 ounces) With mounting bracket: 0.5 kg (17.5 ounces)
Operating Temperature	0° C to +50° C (32° F to 122° F)
Storage Temperature	-20° C to +70° C (-4° F to +158° F)
Humidity	10% to 95% noncondensing

Table 6. AP Mechanical and Compliance Specifications (continued)

Specification	Description
Power over Ethernet (PoE)	42 VDC to 57 VDC (46 VDC nominal) IEEE 802.3af
Status indicators	Health/WSS and radio LEDs (For descriptions of the LEDs, see "Status LEDs" on page 25.)
Wired network ports	Two RJ-45 ports for 10/100BASE-T Ethernet and Power over Ethernet (PoE) for the 2332 Series only.
Standards compliance	IEEE 802.11 IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.3af
Safety and electromagnetic compliance	FCC Part 15, UL 60950 IC Part 15, CSA 22.2 N0-950, RSS-139-1 and RSS-210 ETS 300-328 (2.4 GHz) and 301-893 (5 GHz), EN 301-489-17 R&TTE Directive 1999/5/EC TELEC, ARIB T66 GBT-15941-1995, GBT-16841-1997 LP0002
Encryption	Wi-Fi Protected Access (WPA) Advanced Encryption Standard (AES) 40-bit/104-bit Wired-Equivalent Privacy (WEP)
General	Power-save mode supported Transmit power control in 1 dB increments Supports up to 250 clients per radio

Table 7. 802.11a Radio Specifications

Specification	Description
Antenna type	Integrated omnidirectional with (2) radiating elements to allow for the use of diversity
Antenna gain	Internal: 5.15 - 5.25 GHz = 3.18 dBi peak, 5.25 - 5.35 GHz = 2.83 dBi peak, 5.470 - 5.725 GHz = 2.50 dBi peak and 5.725 - 5.850 GHz = 2.44 dBi peak
Frequency band	5.15 - 5.25 GHz, 5.25 - 5.35 GHz, 5.470 - 5.725 GHz and 5.725 - 5.85 GHz, based on country regulations
Operating channels	Based on the country of operation specified by the system administrator
Association rates	54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, and 6 Mbps, with automatic fallback
Modulation	Orthogonal frequency division multiplexing (OFDM)
Transmit power	Based on the country of operation specified by the system administrator

Table 8. 802.11b Radio Specifications

Specification	Description
Antenna type	Integrated omnidirectional with (2) radiating elements to allow for the use of diversity
Antenna gain	Internal: 3.86 dBi peak (Azimuth) and 2.48 dBi peak (Elevation)
Frequency band	2.4 GHz to 2.4835 GHz based on country regulations
Operating channels	Based on the country of operation specified by the system administrator
Association rates	11 Mbps, 5.5 Mbps, 2 Mbps, and 1 Mbps, with automatic fallback
Modulation	BPSK, QPSK, CCK
Transmit power	Based on the country of operation specified by the system administrator

Table 9. 802.11g Radio Specifications

Specification	Description
Antenna type	Integrated omnidirectional with (2) radiating elements to allow for the use of diversity
Antenna gain	Internal: 3.86 dBi peak (Azimuth) and 2.48 dBi peak (Elevation)
Frequency band	2.4 GHz to 2.4835 GHz based on country regulations
Operating channels	Based on the country of operation specified by the system administrator
Association rates	54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, and 6 Mbps, with automatic fallback
Modulation	Orthogonal frequency division multiplexing (OFDM)
Transmit power	Based on the country of operation specified by the system administrator

MAC addresses

Each Series 2332 access point is assigned a unique block of 64 MAC addresses. Each radio has 32 MAC addresses and can therefore support up to 32 SSIDs, with one MAC address assigned to each SSID as its BSSID.

An AP's MAC address block is listed on a label on the back of the AP. If the AP is already deployed and running on the network, you can display the MAC address assignments by using the **show {ap | dap} status** command.

All MAC addresses on an AP are assigned based on the AP's base MAC address, as described in Table 9 on page 130.

Table 10. MAC Address Allocations on a Series 2332 access point

AP base MAC Address	• The AP has a base MAC address. All the other addresses are assigned based on this address.
Ethernet Port MAC Addresses	• Ethernet port 1 equals the AP base MAC address. • Ethernet port 2 equals the AP base MAC address + 1.
802.11a Radio and SSID MAC Addresses	• The 802.11a radio equals the AP base MAC address + 1. • The BSSIDs for the SSIDs configured on the 802.11a radio end in odd numbers. The first BSSID is equal to the AP's base MAC address + 1. The next BSSID is equal to the AP's base MAC address + 3, and so on.
802.11b/g Radio and SSID MAC Addresses	• The 802.11b/g radio equals the AP base MAC address. • The BSSIDs for the SSIDs configured on the 802.11b/g radio end in even numbers. The first BSSID is equal to the AP's base MAC address. The next BSSID is equal to the AP's base MAC address + 2, and so on.

Translated caution statement, warning conventions and warning messages

The following caution statement, warning conventions, and warning messages apply to this manual.

Caution! The WLAN Access Point 2332 Series radios are disabled by default and can be enabled only by a system administrator using the WSS.

Attention! Les communications radios points d'accès WLAN 2332 Série de sont désactivées par défaut et peuvent être activées uniquement par un administrateur système utilisant le WSS.

Achtung! Der WLAN Access Point 2332 Familie Radios sind standardmäßig ausgeschaltet und können nur durch einen Systemadministrator unter Verwendung des WSS eingeschaltet werden.

Precaución! Las radios Punto de acceso 2332 Série WLAN de se desactivan en forma predeterminada y pueden activarse sólo con un administrador de sistema utilizando el WSS.

Cuidado! Os rádios WLAN Access Point 2332 Série estão desativados por padrão e só podem ser ativados por um administrador de sistema usando WSS.

Attenzione! Le radiazioni del dispositivo WLAN Access Point 2332 Serie vengono disattivate per impostazione predefinita e possono essere attivate soltanto da un amministratore di sistema tramite WSS.

Warning conventions

Warning! This situation or condition can cause injury.

Avertissement! Cette situation ou condition peut entraîner un risque de blessure.

Warnung! Diese Situation oder dieser Umstand kann zu Verletzungen führen.

Advertencia! Esta situación o condición puede causar lesiones.

Aviso! Esta situação ou condição pode causar ferimentos.

Avviso! Situazione o condizione che può causare ferite.

Warning! High voltage. This situation or condition can cause injury due to electric shock.

Avertissement! Tension élevée. Cette situation ou condition peut entraîner un risque de blessure provoquée par un choc électrique.

Warnung! Hochspannung. Diese Situation oder dieser Umstand kann zu Verletzungen durch Stromschläge führen.

Advertencia! Alto voltaje. Esta situación o condición puede causar lesiones debido a electrocución.

Aviso! Alta tensão. Esta situação ou condição pode causar ferimentos devido a choque elétrico.

Avviso! Alta tensione. Questa situazione o condizione può causare ferite dovute a scosse elettriche.

Qualified service personnel warning

Warning! Only qualified service personnel must perform installation. Read and follow all warning notices and instructions marked on the product or included in the documentation.

Avertissement! L'installation doit être effectuée exclusivement par un personnel qualifié. Lisez et conformez-vous à tous les avis et instructions d'avertissement indiqués sur le produit ou dans la documentation.

Warnung! Nur qualifiziertes Wartungspersonal darf die Installation vornehmen. Lesen und befolgen Sie die Warnungshinweise und Anweisungen, die auf dem Produkt gekennzeichnet oder in der Dokumentation enthalten sind.

Advertencia! Sólo el personal de servicio calificado podrá realizar la instalación. Lea y siga todas las instrucciones y advertencias marcadas en el producto o incluidas en la documentación.

Aviso! Apenas profissionais de atendimento técnico qualificados devem realizar a instalação. Leia e siga todos os avisos e instruções destacados no produto ou que façam parte da documentação.

Avviso! L'installazione deve essere eseguita esclusivamente da personale qualificato. Leggere e seguire tutti gli avvisi e le istruzioni presenti sul prodotto o inclusi nella documentazione.

Radio safety warnings

Warning! Install this device in such a manner as to maintain a minimum of 20 cm (7.9 inches) separation distance between the radiating element(s) and all persons. This safety warning conforms with FCC radio frequency exposure limits.

Avertissement! Installez cet appareil de façon à maintenir une distance d'au moins 20 cm entre les éléments rayonnants et tout individu. Cet avertissement de sécurité est conforme aux limites d'exposition aux radiofréquences établies par la FCC.

Warnung! Installieren Sie das Gerät so, dass zwischen dem strahlenden Element bzw. den strahlenden Elementen und allen Personen mindestens ein Abstand von 20 cm eingehalten wird. Diese Sicherheitswarnung richtet sich nach den Grenzwerten für die Belastung durch Hochfrequenz der FCC.

Advertencia! Instale este dispositivo de tal manera que mantenga una distancia de separación mínima de 20 cm. (7.9 pulgadas) entre los elementos emisores y todas las personas. Esta advertencia de seguridad está de acuerdo con los límites de exposición de frecuencia radioeléctrica de la FCC (Comisión Federal de las Comunicaciones).

Aviso! Instale o dispositivo de modo que exista um mínimo de 20 cm (7,9 polegadas) de distância de separação entre o(s) elemento(s) radiador(es) e as pessoas. Esse aviso de segurança está em conformidade com os limites de exposição à radiofreqüência especificados pela FCC.

Avviso! Installare il dispositivo in modo tale da mantenere una distanza minima di 20 cm tra gli elementi irradianti e le persone. Questo avviso sulla sicurezza è conforme ai limiti FCC sull'esposizione alla frequenza radio.

Warning! Do not operate access point near unshielded blasting caps or in an otherwise explosive environment unless the device has been modified for such use by qualified personnel.

Avertissement! Ne faites pas fonctionner de point d'accès à proximité de détonateurs non blindés ou dans des milieux présentant des risques d'explosion à moins que l'appareil n'ait été modifié pour cet usage par un personnel qualifié.

Warnung! Bedienen Sie den Zugangspunkt nicht in der Nähe von unabgeschirmten Zündkapseln oder anderweitig explosionsgefährdeten Umgebungen, außer das Gerät wurde durch geschultes Wartungspersonal für diese Verwendung geändert.

Advertencia! No maneje el punto de acceso cerca de cápsulas detonadoras no aisladas o en ambientes explosivos a menos que el dispositivo haya sido modificado para ese uso por personal calificado.

Aviso! Não opere um ponto de acesso próximo a detonadores sem proteção ou em ambientes explosivos a não ser que o dispositivo tenha sido modificado para ser desta forma utilizado por pessoal qualificado.

Avviso! Non utilizzare il punto di accesso nelle vicinanze di involucri esplosivi non schermati o in qualsiasi ambiente in cui siano presenti sostanze esplosive, a meno che il dispositivo non sia stato modificato per tale uso da personale qualificato.

Warning! Do not touch or move the access point when the antennas are transmitting or receiving.

Avertissement! Ne touchez pas le point d'accès lors de l'émission ou de la réception des antennes.

Warnung! Berühren und bewegen Sie den Zugangspunkt nicht, wenn die Antennen senden oder empfangen.

Advertencia! No toque ni mueva el punto de acceso cuando las antenas transmiten o reciben.

Aviso! Não toque ou desloque o ponto de acesso enquanto as antenas estiverem transmitindo ou recebendo dados.

Avviso! Non toccare o spostare il punto di accesso mentre le antenne sono in fase di trasmissione o ricezione.

Warning! Before using a wireless device in a hazardous location, consult the local codes, national codes, and safety directors of the location for usage constraints.

Avertissement! Avant d'utiliser un appareil sans fil dans un endroit dangereux, consultez la réglementation locale et nationale ainsi que les responsables de la sécurité de l'endroit concerné pour obtenir des informations relatives aux conditions et aux limites d'utilisation de cet appareil.

Warnung! Bevor Sie ein drahtloses Gerät an einem gefährlichen Ort verwenden, informieren Sie sich über die regionalen und landesweiten Gesetze, und wenden Sie sich an Orten mit Nutzungsbeschränkungen an die Sicherheitsbeauftragten.

Advertencia! Antes de utilizar un dispositivo inalámbrico en una ubicación peligrosa, consulte los códigos locales, nacionales y los directorios de seguridad de la ubicación acerca de las restricciones de uso.

Aviso! Antes de usar um dispositivo sem fio em local perigoso, consulte as normas locais e nacionais, além de diretrizes de segurança locais para se informar sobre restrições de uso.

Avviso! Prima di utilizzare un dispositivo wireless in un ambiente pericoloso, controllare i codici locali e nazionali e consultare i relativi servizi antinfortunistici per le restrizioni sull'uso.

Warning! Intentional radiators, such as the WLAN Access Point 2332 Series are not intended to be operated with any antenna(s) other than those furnished by . An intentional radiator may only be operated with the antenna(s) with which it is authorized. For a complete listing of the authorized antennas for use with this product, visit http://www.avaya.com/support

Avertissement! Les émetteurs intentionnels, tels que les points d'accès WLAN 2332 Série de ne sont pas destinés à fonctionner avec des antennes autres que celles fournies par . Un émetteur intentionnel peut fonctionner uniquement avec une antenne agréée. Pour une liste complète des antennes agréées à utiliser avec ce produit, rendez-vous sur le site Web http://www.avaya.com/support

Warnung! Vorsätzliche Funksender wie der WLAN Access Point 2332 Familie dürfen nicht mit anderen, als den von bereitgestellten Antennen verwendet werden. Ein vorsätzlicher Funksender darf nur mit den Antennen verwendet werden, für die er autorisiert ist. Eine vollständige Liste mit allen autorisierten Antennen für dieses Produkt finden Sie unter http://www.avaya.com/support

Advertencia! Los equipos que generan transmisiones intencionales, como el Punto de acceso 2332 Série WLAN de no están ideados para funcionar con ninguna antena que no esté diseñada por . Los equipos que generan transmisiones intencionales pueden funcionar sólo con las antenas para las que están autorizados. Para obtener una lista completa de las antenas autorizadas para este producto, visite http://www.avaya.com/support

Aviso! Radiadores por definição, como o WLAN Access Point 2332 Série não devem ser operados com nenhuma outra antena senão aquela fornecida pela . Estes radiadores devem operar apenas com antena(s) cujo uso seja autorizado. Para uma lista completa das antenas que têm autorização para serem usadas com o produto, acesse http://www.avaya.com/support

Avviso! I trasmettitori intenzionali, quali WLAN Access Point 2332 Serie non sono progettati per il funzionamento con antenne di tipo diverso da quello fornito da . Un trasmettitore intenzionale può funzionare esclusivamente con le antenne per le quali dispone di autorizzazione. Per un elenco completo delle antenne autorizzate per l'uso di questo prodotto, visitare il sito http://www.avaya.com/support

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