Cisco Aironet 2.4-GHz MIMO 6-dBi Patch Antenna (AIR-ANT2460NP-R)

This document outlines the specifications for the Cisco Aironet 2.4-GHz MIMO 6-dBi Patch Antenna (AIR-ANT2460NP-R) and provides instructions for mounting it. The antenna operates in the 2.4-GHz frequency range and is designed for indoor or outdoor use.

The following information is provided in this document.

Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Technical Specifications

Antenna type	3-element MIMO patch
Operating frequency range	2400–2484 MHz
VSWR	2:1 or less
Peak gain	6-dBi
Polarization	Linear, vertical
Azimuth plane 3D beamwidth	80°
Elevation plane 3D beamwidth	75°
Front-to-back ratio	10-dB
Length	5.8 in. (14.7 cm)
Width	11.25 in. (28.57 cm)
Depth	1.13 in. (2.87 cm)
Cable length and type	3-ft(91.4 cm), plenum rated
Connector	RP-TNC
Environment	Indoor/Outdoor
Operating temperature	-22° F to 158° F (-30° C to 70° C)
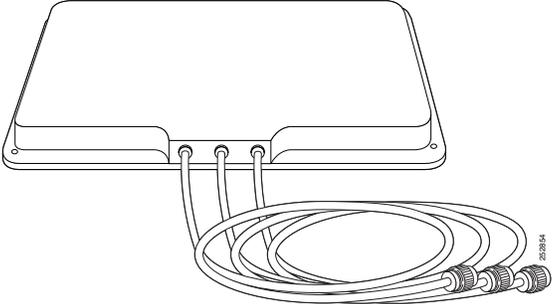
**Left Antenna Azimuth and Elevation
Radiation Patterns**
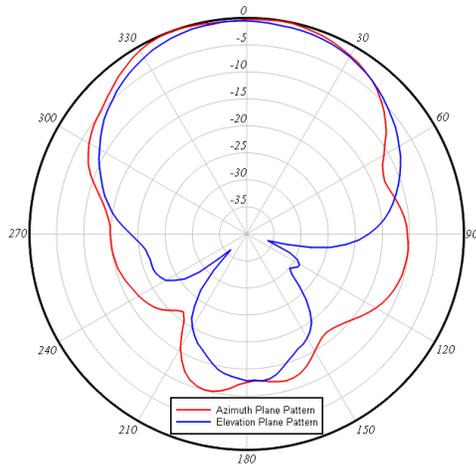
**Middle Antenna Azimuth and Elevation
Radiation Patterns**
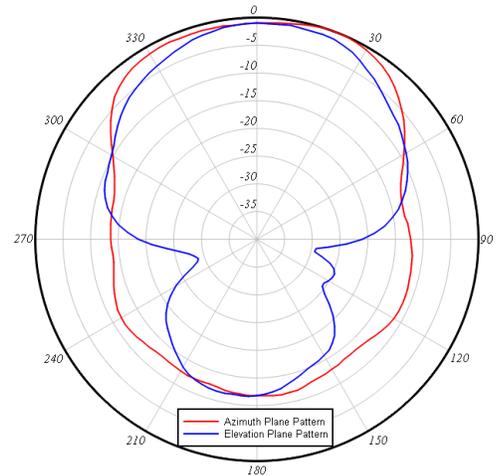
**Right Antenna Azimuth and Elevation
Radiation Patterns**
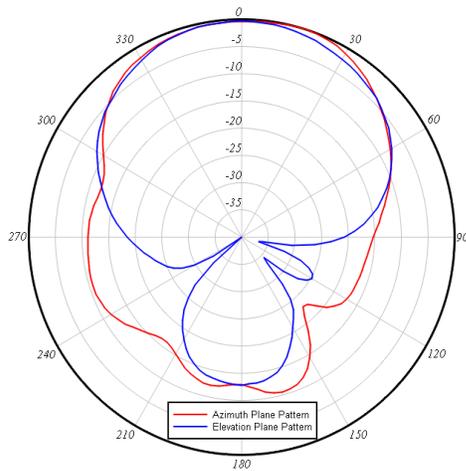
System Requirements

This antenna is designed for indoor or outdoor use with any 2.4-GHz Cisco Aironet radio device that uses a RP-TNC connector.

Safety Precautions

Translated versions of the following safety warnings are provided in the *Safety Warnings for Cisco Aironet Antennas,* which is available at http://cisco.com.

⚠
Warning   **Installation of this antenna near power lines is dangerous. For your safety, follow the installation directions.**

Each year hundreds of people are killed or injured when attempting to install an antenna. In many of these cases, the victim was aware of the danger of electrocution but did not take adequate steps to avoid the hazard.

For your safety, and to help you achieve a good installation, please read and follow these safety precautions. **They may save your life!**

1. If you are installing an antenna for the first time, for your own safety as well as others, seek professional assistance. Your Cisco sales representative can explain which mounting method to use for the size and type antenna you are about to install.

2. Select your installation site with safety as well as performance in mind. Remember: electric power lines and phone lines look alike. For your safety, assume that any overhead line can kill you.

3. Call your electric power company. Tell them your plans and ask them to come look at your proposed installation. This is a small inconvenience considering your life is at stake.

4. Plan your installation carefully and completely before you begin. Successful raising of a mast or tower is largely a matter of coordination. Each person should be assigned a specific task, and should know what to do and when to do it. One person should be in charge of the operation to issue instructions and watch for signs of trouble.

5. When installing your antenna, remember:
   a. **Do not** use a metal ladder.
   b. **Do not** work on a wet or windy day.
   c. **Do** dress properly—shoes with rubber soles and heels, rubber gloves, long sleeved shirt or jacket.

6. If the assembly starts to drop, get away from it and let it fall. Remember, the antenna, mast, cable, and metal guy wires are all excellent conductors of electrical current. Even the slightest touch of any of these parts to a power line completes an electrical path through the antenna and the installer: **You!**

7. If any part of the antenna system should come in contact with a power line, **don't touch it or try to remove it yourself. Call your local power company**. They will remove it safely.

8. If an accident occurs with the power lines, call for qualified emergency help immediately.

Installation Notes

Antennas transmit and receive radio signals which are susceptible to RF obstructions and common sources of interference that can reduce the throughput and range of the device to which they are connected. Follow these guidelines to ensure the best possible performance:

- Install the antenna vertically and mount it with the cables pointing towards the ground.

- Keep the antenna away from metal obstructions such as heating and air-conditioning ducts, large ceiling trusses, building superstructures, and major power cabling runs. If necessary, use a rigid conduit to lower the antenna away from these obstructions.

- The density of the materials used in a building's construction determines the number of walls the signal can pass through and still maintain adequate signal strength. Consider the following before choosing the location for your antenna:

  - Signals penetrate paper, vinyl and drywall the easiest.

  - Signals will be more heavily attentuated passing through concrete and solid wood walls.

  - Signals will likely reflect off a thick metal wall and may not penetrate it at all.

  - Signals will likely reflect off a chain link fence or wire mesh spaced between 1 and 1 1/2 in. (2.5 and 3.8 cm). The fence acts as a harmonic reflector that blocks the signal.

- Install the antenna away from microwave ovens and 2-GHz cordless phones. These products can cause signal interference because they operate in the same frequency range as the device to which your antenna is connected.

Choosing a Mounting Location

The antenna should be mounted clear of any obstructions to the sides of the radiating elements. Generally, the higher an antenna is above the floor, the better it performs. If possible, find a mounting place directly above your wireless device to ensure the lead-in cable can be as short as possible.

Installing the Antenna

You can install the antenna on any flat indoor or outdoor vertical surface. Hardware for mounting the antenna on drywall is provided. If you intend to install your antenna on another surface, you must provide the appropriate hardware.

Note Four mounting screws are provided to mount the antenna. To ensure a safe, reliable, and long-standing installation, you must use all four screws to mount the antenna.

Tools and Equipment Required

A mounting installation kit is shipped with the antenna and consists of the following hardware:

- Four #8 x 1¼ screws

- Four #8 plastic anchors

- Four end caps

You need the following tools and equipment, which are not provided.

- A Phillips screwdriver
- A drill
- A #29 ((0.136-in (3.45 mm)) drill bit (For drywall installation, other surfaces may require a different size)
- A pencil
- A small mallet or hammer

Mounting on a Vertical Surface

Follow these steps to mount your antenna on a vertical surface. This procedure describes mounting the antenna on a drywall surface. If you are mounting the antenna on any other type of surface, your procedure may vary slightly.

Step 1   Determine the location where you will mount the antenna.

Step 2   Use the antenna as a template to mark the locations of the four mounting holes.

Step 3   Use a drill and #29 drill bit to drill four holes at the locations you marked in Step 2.

Step 4   Start a plastic anchor into each hole.

Step 5   Use a mallet or small hammer to seat the anchors into the wall.

Step 6   Align the antenna's mounting holes with the anchors.

Step 7   Start a #8 x 1¼ screw into each antenna mounting hole.

Step 8   Use a Phillips screwdriver to secure the antenna to the wall. Do not overtighten.

Step 9   Install the end caps into the antenna mounting holes.

Step 10   Remove the yellow outdoor installation warning label from the antenna radome.

Outdoor Installations

You can mount this antenna outdoors. If you mount the antenna outdoors, you must provide the mounting hardware. For outdoor installations, Follow the instructions printed on the back of the antenna.

⚠

Caution   An orientation arrow is printed on the back of the antenna that indicates the orientation for outdoor installations. You must install the antenna with the orientation arrow pointing up to prevent any water intrusion and to provide a drain for any moisture that may accumulate inside the antenna.

Suggested Cable

Cisco recommends a high-quality, low-loss cable for use with the antenna.

Note   Coaxial cable loses efficiency as the frequency increases, resulting in signal loss. The cable should be kept as short as possible because cable length also determines the amount of signal loss (the longer the run, the greater the loss).

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New* in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Cisco Aironet 2.4-GHz MIMO 6-dBi Patch Antenna (AIR-ANT2460NP-R)