



# Cisco Outdoor 5 dBI Omni Antenna for 863-928 MHz WPAN, LoRaWan, and ISM (ANT-LPWA-DB-0-N-5)

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## Overview

This document describes the 5 dBI Outdoor Omni-directional Antenna for the Cisco WPAN, LoRaWan, ISM modules and routers operating in frequency ranges between 863-928 MHz, such as 863-876 MHz ETSI, or 902-928 MHz ISM bands. In addition, this document provides the antenna specifications and mounting instructions for the antenna.

## Technical Specifications

The Outdoor Omni-directional Antenna features the following:

- UV-resistant fiberglass radome
- Heavy duty mounting bracket
- Gold anodized sleeve and top cap with N (female) connector
- DC-grounded for ESD protection



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**Note** Antenna data sheets often claim lightning protection, while in reality only providing a DC ground path for ESD protection. Cisco recommends use of a lightning arrestor for all antennas potentially exposed to lightning strikes

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Figure 1: Outdoor Omni-directional Antenna



## Specifications

The following table provides RF and Mechanical Specification.

Specification	Description	
Frequency Bands	<b>863-876 MHz</b>	<b>902-928 MHz</b>
Peak Gain (dBi) Typical	5.2 dBi	5.4 dBi
Peak Gain (dBi) Max	5.3 dBi	5.6 dBi
Efficiency	74%-81%	75%-83%
VSWR (Avg)	1.5:1	1.5:1
VSWR (Max)	1.65:1	1.65:1
Azimuth 3 dB Beam width	360°	360°
Elevation 3 dB Beam width	28°-30°	27°-29°
Azimuth Ripple (Max), dB	0.6	0.8
Nominal Impedance	50 Ohms	

Specification	Description
Polarization	Vertical
Anti-Static Protection	DC Grounded
Max Power (Ambient 25°C)	10 Watts
Antenna Dimension (H x Diameter)	692 x 33.3 mm (27.2" x 1.3")
Connector	Type N Female
Weight	0.79 kg (1.7 lbs)
Antenna Color	White
Radome	Fiberglass
Wind Operational	161 km/h (100 mph)
Wind Survival	266 km/h (165 mph)
Operating Temperature	-40°C to +70°C (-40°F to +158°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Ingression Protection	IP67
Material Substance Compliance	RoHS
Environmental Testing	Antenna passed extensive environmental and mechanical tests appropriate for mast mount applications.

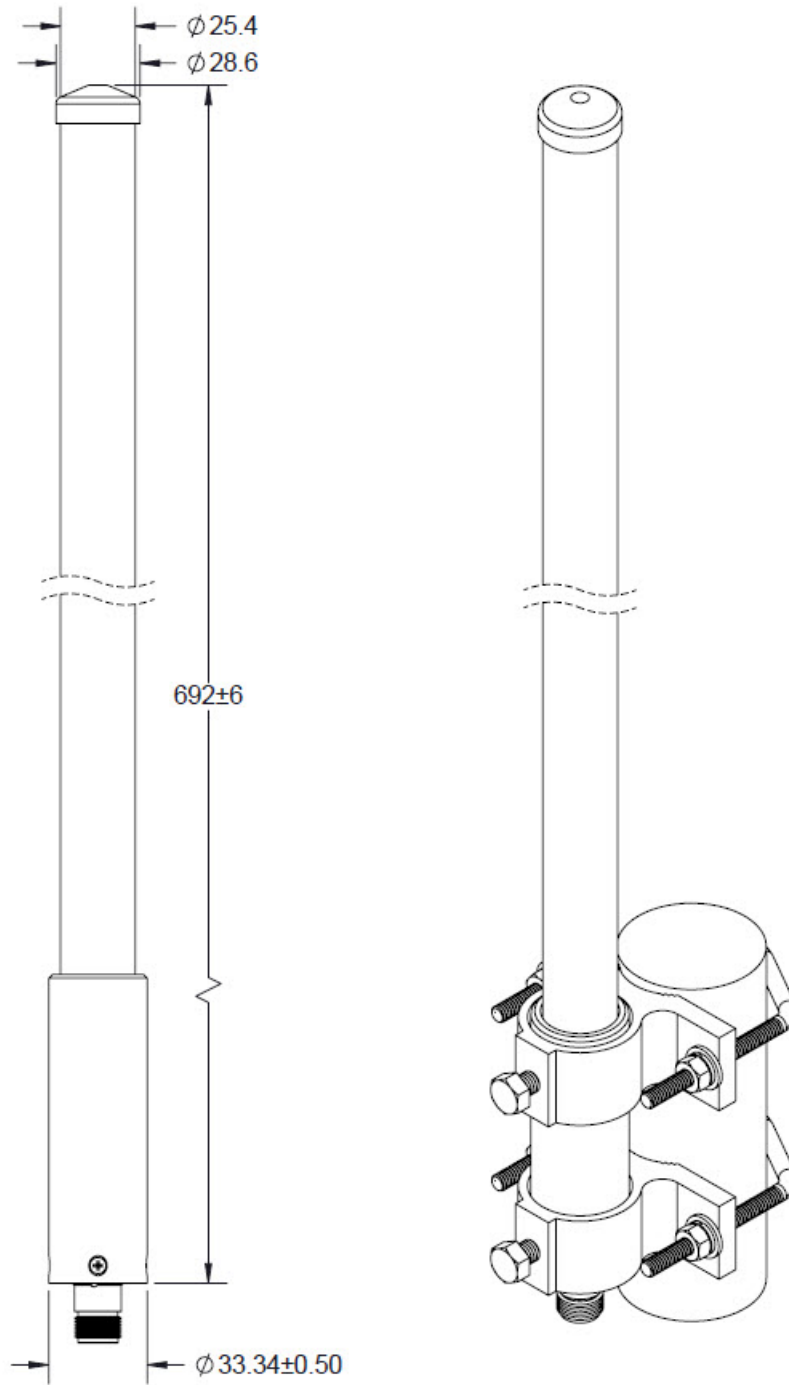


**Note** Antenna must be mounted vertically to obtain omni-directional coverage horizontally. Please see antenna radiation pattern.

## Dimensions

The following graphic shows the Antenna Dimensions.

Figure 2: Dimensions

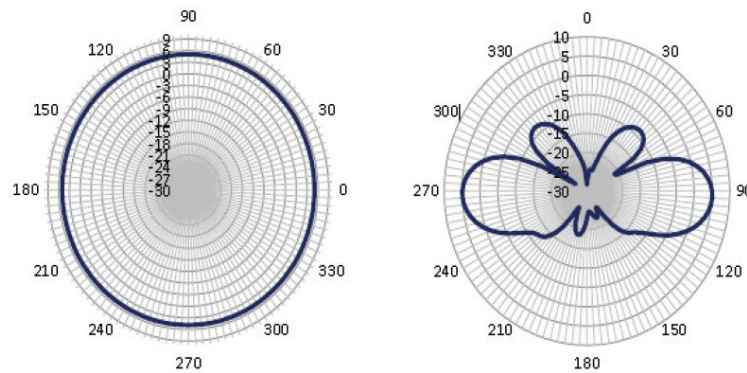


**Note** Antenna dimensions are shown in Millimeters.

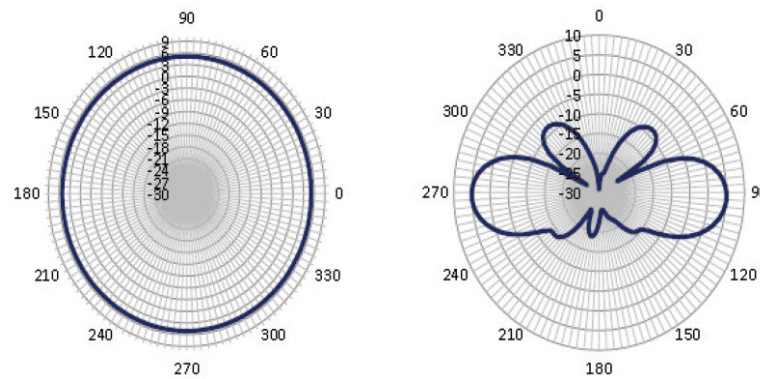
# Antenna Radiation Patterns

The following sequence of illustrations show the different antenna radiation patterns. The azimuth radiation plane is shown on the left, and elevation plane pattern is shown on the right.

**Figure 3: 863 MHz Radiation Pattern**



**Figure 4: 869 MHz Radiation Pattern**



**Figure 5: 876 MHz Radiation Pattern**

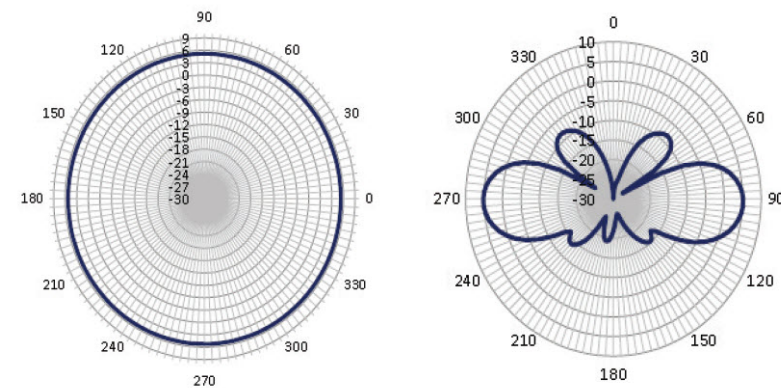


Figure 6: 902 MHz Radiation Pattern

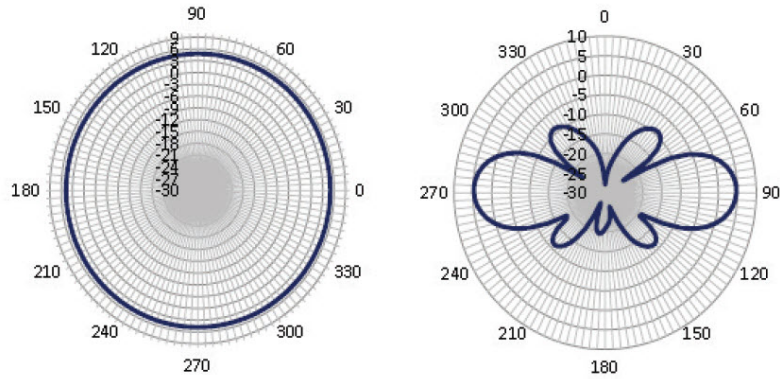


Figure 7: 914 MHz Radiation Pattern

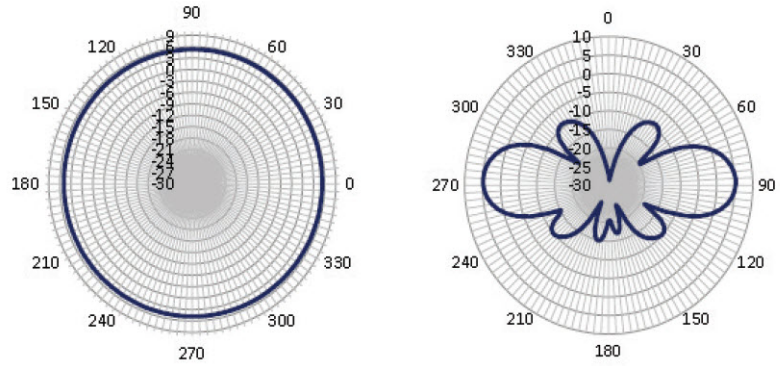
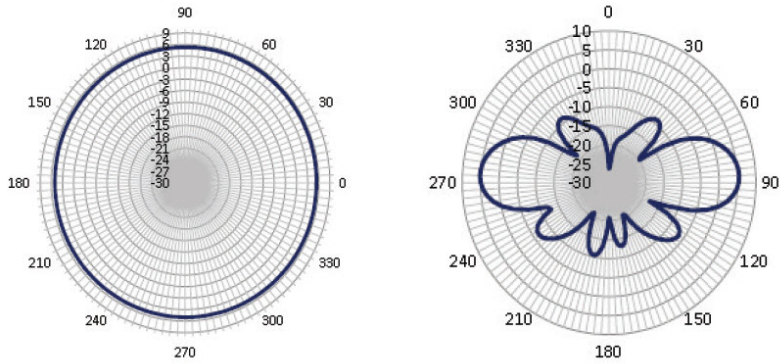


Figure 8: 928 MHz Radiation Pattern



# General Safety Precautions



**Warning** This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. **Statement 1071**



**Warning** Do not work on the system or connect or disconnect cables during periods of lightning activity. **Statement 1001**



**Warning** Do not locate the outdoor antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, as they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (for example, U.S.:NFPA 70, National Electrical Code, Article 810, Canada:Canadian Electrical Code, Section 54). **Statement 1052**



**Warning** In order to comply with FCC radio frequency (RF) exposure limits, antennas should be located at a minimum of 7.9 inches (20 cm) or more from the body of all persons. **Statement 332**

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.



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

For your safety, read and follow these safety precautions.

- 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.
- Before you install an antenna, contact your Cisco account representative to explain which mounting method to use for the size and type of antenna that you are about to install.
- Find someone to help you—installing an antenna is often a two-person job.
- Select your installation site with safety, as well as performance, in mind. Remember that electric power lines and phone lines look alike. For your safety, assume that any overhead line can kill you.
- Contact your electric power company. Tell them your plans and ask them to come look at your proposed installation.
- Plan your installation carefully and completely before you begin. Each person involved in an installation should be assigned to 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.

- When installing your antenna, follow these guidelines:
  - Do not use a metal ladder.
  - Do not work on a wet or windy day.
  - Do dress properly—wear shoes with rubber soles and heels, rubber gloves, and a long-sleeved shirt or jacket.
- If the assembly starts to drop, move away from it and let it fall. Because 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.
- If any part of the antenna system should come in contact with a power line, do not touch it or try to remove it yourself. Call your local power company to have it removed safely.
- If an accident should occur with the power lines, call for qualified emergency help immediately.

## Antenna Installation

The antenna installation includes the following procedures:

### Tools and Equipment Required

In addition to the parts included in the antenna kit, you must provide the following tools to install the antenna on the router:

- 1/2" & 7/16" open-end wrench



#### Note

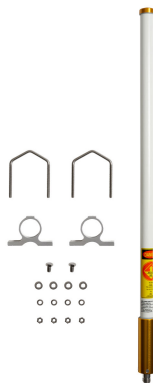
This list does not include the tools and equipment required to assemble and erect the tower, mast, or other structure you intend to mount your antenna on.

### Mounting Components

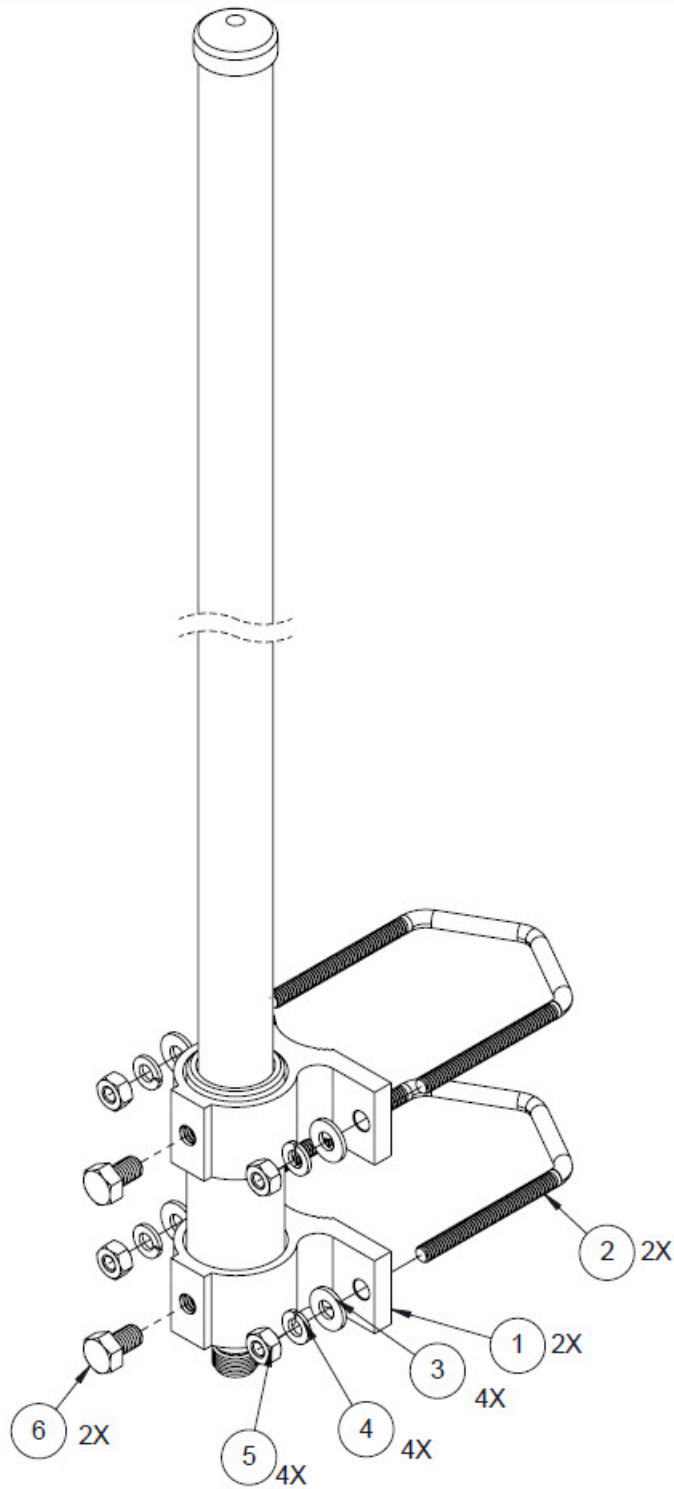
The antenna can be mounted on a 1-1/2" to 2-1/2" (3.81 to 6.35 cm) pole, extension arm, or mast.

The antenna and mounting components are shown in the following figure.

**Figure 9: Antenna Mounting Components**







Item Number	Description	Quantity
1	External Bracket, AL, FOR FM2	2
2	V-Bolt Clamp, 1/4-20, ST, NF Fits a 1-1/2" to 2-1/2" (3.81 to 6.35 cm) pole.	2
3	Flat Washer, 1/4in, SS, PA	4
4	Split-lock Washer, 1/4	4
5	Hex Nut, [1/4-20], SS, PA	4
6	Hex Bolt, 5/16-18x1/2, SS, NF	2

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