DATASHEET

IsoStation™ AC

Shielded airMAX® ac Radio with Isolation Antenna

Model: IS-5AC

Interchangeable High-Isolation Horn Antenna

All-Metal, Shielded Radio Base

airMAX ac Processor for Superior Performance

UBIQUITI® NETWORKS

Overview

Ubiquiti Networks launches the latest generation of airMAX ac CPE (Customer Premises Equipment) with dedicated Wi-Fi management, the IsoStation™ 5AC.

Improved Noise Immunity

The IsoStation 5AC provides high isolation solutions in fixed beamwidth increments through interchangeable horn antennas that have been optimized for an urban environment. The tailored antenna radiation patterns spatially filters both in-band and out-of-band spurious RF emissions to increase the noise immunity of the IsoStation 5AC. This feature is especially important in an increasingly congested RF environment.

Modular Design

The interchangeable antenna improves beam-shaping for specific deployment needs. By default, the IsoStation 5AC includes the symmetrical horn antenna with 45° beamwidth.

Scalability

Horn antennas increase co-location performance without sacrificing gain.

Symmetrical horn antennas (30° and 45° versions) offer breakthrough scalability options for wireless systems. Unique beam performance and great co-location characteristics allow for a higher density of sectors than traditional sector technology.

Enhanced Co-Location

Asymmetrical horn antennas (60° and 90° versions) are designed to have attenuated side lobes and extremely low back radiation. They offer best front-to-back ratio in the industry and the lowest side lobe radiation. Asymmetrical horn antennas are ideal for cluster sector installations with high co-location requirements.

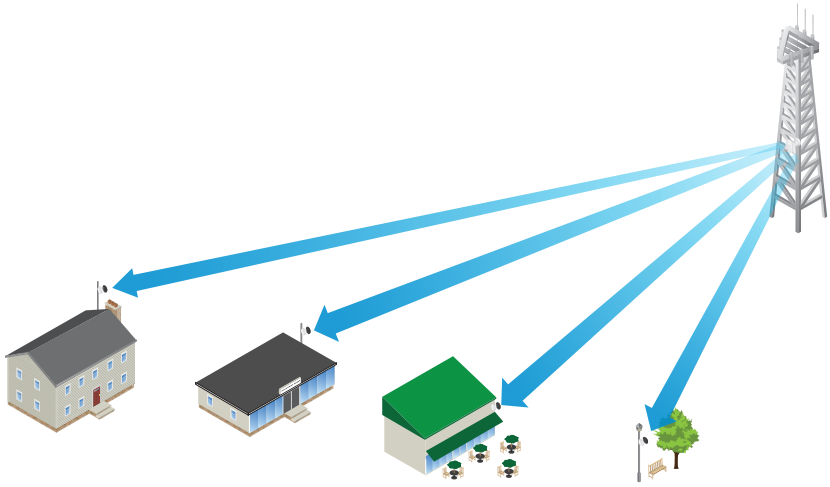
Extended Performance

A robust dish antenna, model U-OMT-Dish, offers excellent beam directivity with 27 dBi of gain. It can be paired with the IsoStation 5AC to extend radio performance for a greater number of WISP customers.

Providing high throughput and an innovative form factor, the IsoStation 5AC is versatile and cost-effective to deploy.

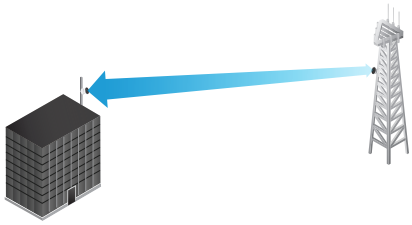
Application Example

PtMP Client Links



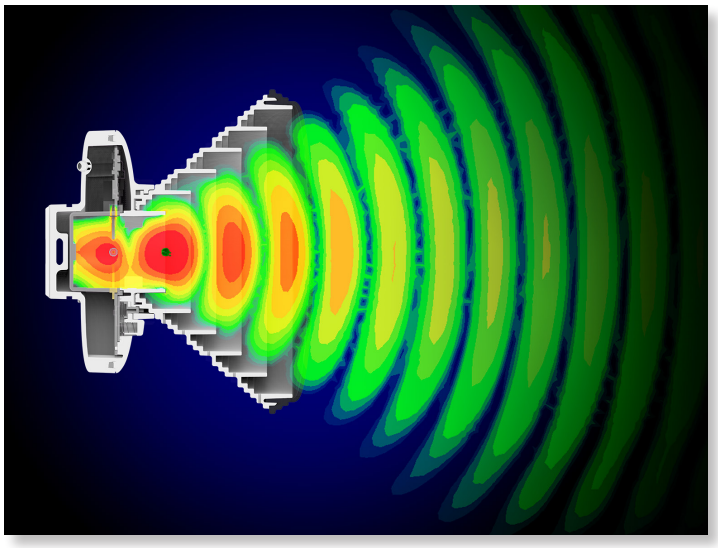
The IsoStation™ 5AC is used as a CPE device for each client in an airMAX PtMP (Point-to-MultiPoint) network.

PtP Link



Use an IsoStation 5AC on each side of a PtP (Point-to-Point) link.

Beam Performance Perfected



Software

airOS®8

Sporting an all-new design for improved usability, airOS® v8 is the revolutionary operating system for Ubiquiti® airMAX ac products.

Powerful Wireless Features

- Access Point PtMP airMAX Mixed Mode
- airMAX ac Protocol Support
- Long-Range Point-to-Point (PtP) Link Mode
- Selectable Channel Width
  - PtP: 10/20/30/40/50/60/80 MHz
  - PtMP: 10/20/30/40 MHz
- Automatic Channel Selection
- Transmit Power Control: Automatic/Manual
- Automatic Distance Selection (ACK Timing)
- Strongest WPA2 Security

Usability Enhancements

- airMagic® Channel Selection Tool
- Dynamic Configuration Changes
- Instant Input Validation
- Redesigned User Interface
- HTML5 Technology
- Optimization for Mobile Devices
- Detailed Device Statistics
- Diagnostic Tools, including Ethernet Cabling Test, RF Diagnostics, and airView® Spectrum Analyzer

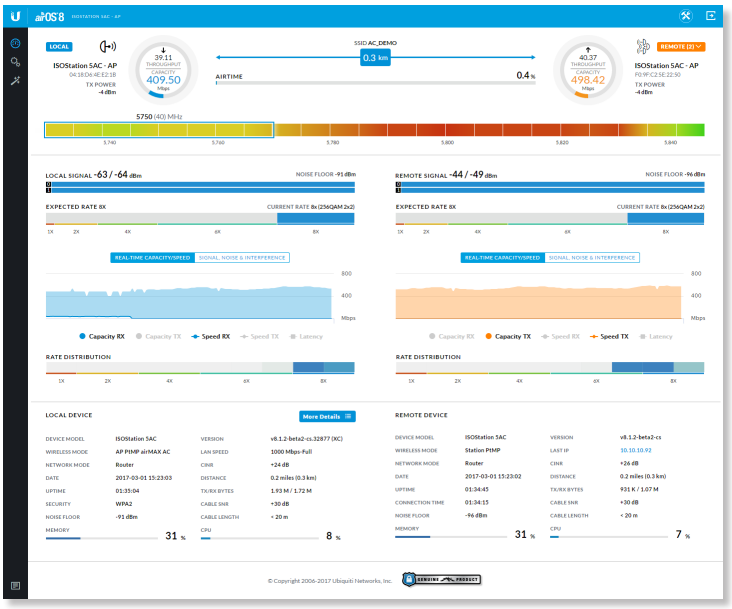
UNMS App

The IsoStation 5AC integrates a separate Wi-Fi radio for fast and easy setup using your mobile device.

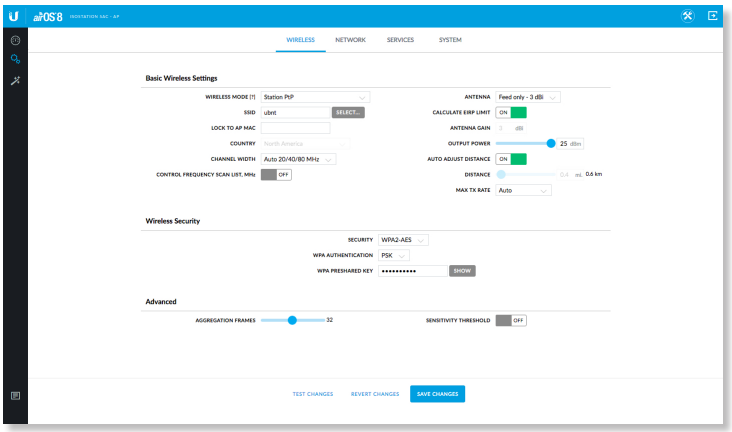
Accessing airOS via Wi-Fi

The UNMS™ (Ubiquiti® Network Management System) app provides instant accessibility to the airOS configuration interface and can be downloaded from the App Store® (iOS) or Google Play™ (Android). UNMS allows you to set up, configure, and manage the IsoStation 5AC and offers various configuration options once you're connected or logged in.

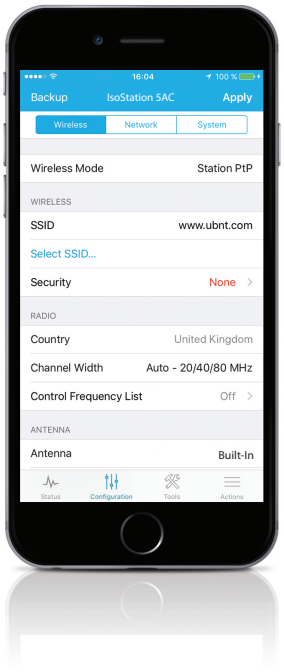
Dashboard



Wireless Settings



UNMS Configuration



Advanced RF Analytics

airMAX ac devices feature a multi-radio architecture to power a revolutionary RF analytics engine.

An independent processor on the PCBA powers a second, dedicated radio, which persistently analyzes the full 5 GHz spectrum and every received symbol to provide you with the most advanced RF analytics in the industry.

Real-Time Reporting

airOS 8 displays the following RF information:

- Persistent RF Error Vector Magnitude (EVM) constellation diagrams
- Carrier to Interference-plus-Noise Ratio (CINR) histograms
- Signal-to-Noise Ratio (SNR) time series plots

Spectral Analysis

airView allows you to identify noise signatures and plan your networks to minimize noise interference. airView performs the following functions:

- Constantly monitors environmental noise
- Collects energy data points in real-time spectral views
- Helps optimize channel selection, network design, and wireless performance

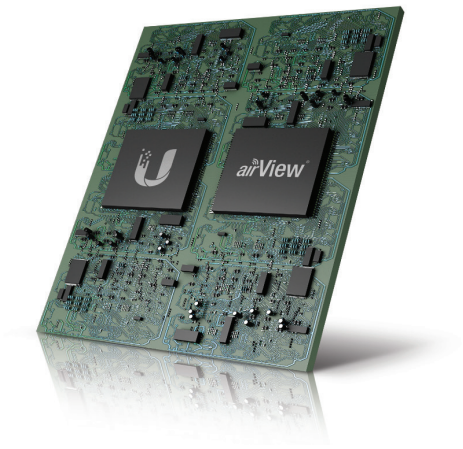
airView runs in the background without disabling the wireless link, so there is no disruption to the network.

In airView, there are three spectral views, each of which represents different data.

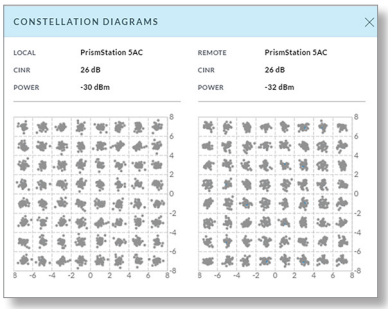
- **Waterfall** Aggregate energy collected for each frequency
- **Waveform** Aggregate energy collected
- **Ambient Noise Level** Background noise energy shown as a function of frequency

airView provides powerful spectrum analyzer functionality, eliminating the need to rent or purchase additional equipment for conducting site surveys.

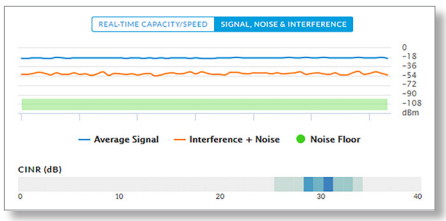
Multi-Radio Architecture



Constellation Diagrams



SNI Diagram and CINR Histogram



Dedicated Spectral Analysis

Technology

airMAX ac

Unlike standard Wi-Fi protocol, Ubiquiti's Time Division Multiple Access (TDMA) airMAX protocol allows each client to send and receive data using pre-designated time slots scheduled by an intelligent AP controller.

This time slot method eliminates hidden node collisions and maximizes airtime efficiency, so airMAX technology provides performance improvements in latency, noise immunity, scalability, and throughput compared to other outdoor systems in its class.

Intelligent QoS Priority assigned to voice/video for seamless streaming.

Scalability High capacity and scalability.

Long Distance Capable of high-speed, carrier-class links.

Superior Performance

The next-generation airMAX ac technology boosts the advantages of our proprietary TDMA protocol.

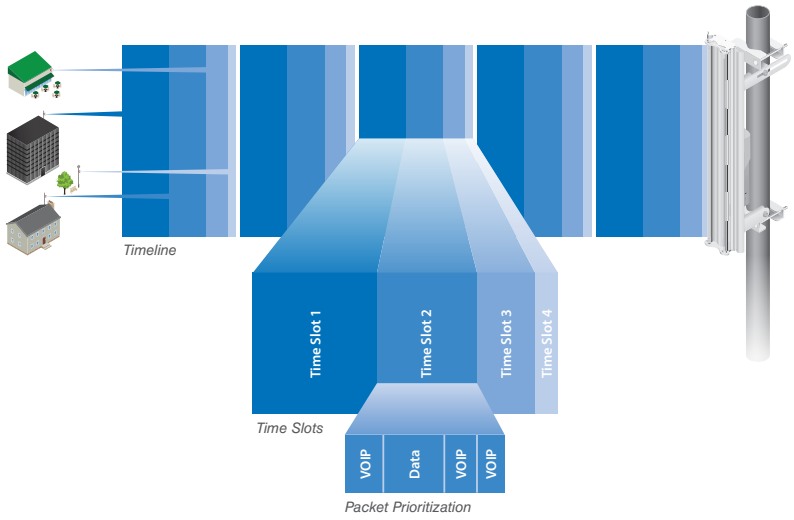
Ubiquiti's airMAX engine with custom IC dramatically improves TDMA latency and network scalability. The custom silicon provides hardware acceleration capabilities to the airMAX scheduler, to support the high data rates and dense modulation used in airMAX ac technology.

Throughput Breakthrough

airMAX ac supports high data rates, which require dense modulation: 256QAM – a significant increase from 64QAM, which is used in airMAX.

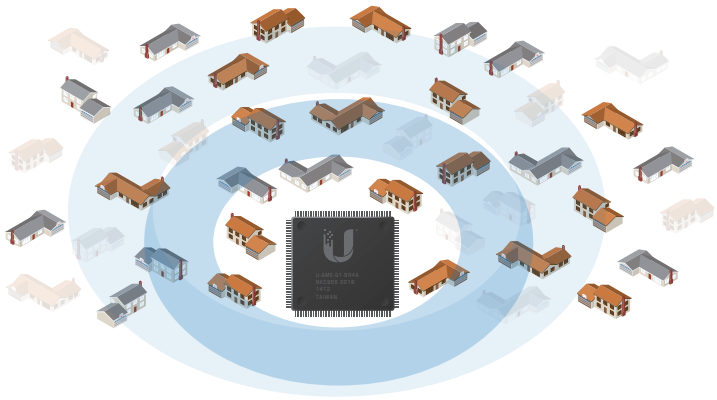
With their use of proprietary airMAX ac technology, airMAX ac products supports up to 450+ Mbps real TCP/IP throughput – up to triple the throughput of standard airMAX products.

airMAX ac TDMA Technology

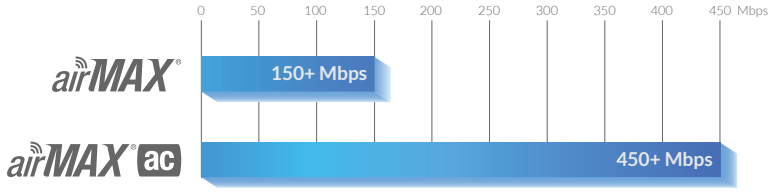


Up to 100 airMAX ac stations can be connected to an airMAX ac Sector; four airMAX ac stations are shown to illustrate the general concept.

airMAX Network Scalability



Superior Throughput Performance



Hardware Overview

Using airMAX ac technology, the IsoStation 5AC supports up to 450+ Mbps real TCP/IP throughput. It also offers the following features:

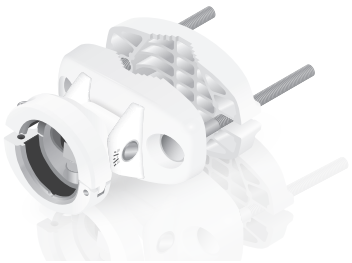
- Interchangeable antennas for enhanced beam shaping
- Horn feed comes directly from the radio input/output so connectors are eliminated
- Single button release for ease of changing antennas
- All metal, shielded radio base
- Metal strap for quick and simple mounting

Pole-Mounting of the IsoStation 5AC

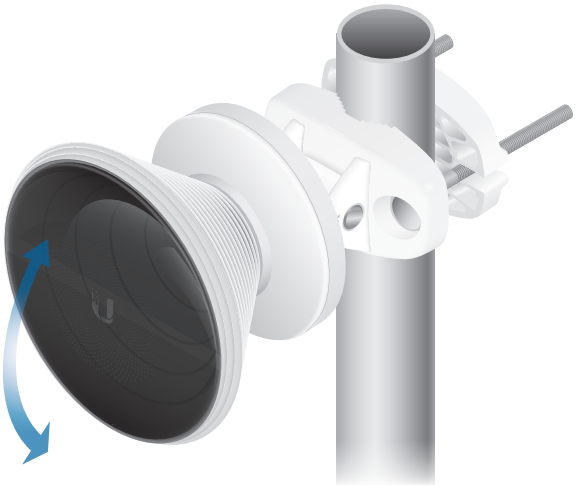
Mounting Flexibility

OMT-Mount

Optional Mounting Bracket



An optional mounting bracket, model U-OMT-MOUNT, allows for ± 20° tilt adjustments of the horn's elevation. This pole-mounting method enables easy adjustments depending on your deployment needs.



Pole-Mounting Using the U-OMT-MOUNT

Antenna Options

Horn Antennas

The IsoStation 5AC comes with a 45° isolation antenna. We offer three optional antennas with precise radiation angles for specific beam shaping, so you can customize the IsoStation 5AC for your specific installation requirements:

- 30°
- 60°
- 90°

All horn antennas are optimized for co-location. The asymmetrical versions (60° and 90°) narrow the elevation pattern to increase gain where users need it.

Switching Out the 45° Horn Antenna

Horn™ 5

Horn Antenna Model Comparison

	Horn-5-30	45° (Included)	Horn-5-60	Horn-5-90	IS-5AC
Beamwidth	30°	45°	60°	90°	
Gain	19 dBi	15.5 dBi	16 dBi	13 dBi	

U OMT-Dish

Dish Antenna

Pair the IsoStation 5AC with a robust dish antenna, model U-OMT-Dish, to provide SISO or 2x2 MIMO, dual-polarity performance as a client in a PtMP link. This radio/antenna combination delivers bandwidth to an extended number of WISP customers.

- Dish reflector design for excellent beam directivity
- Industrial-strength hardware for outdoor use
- HPOL and VPOL Beamwidth: 6.5°
- Antenna gain: 27 dBi

Specifications

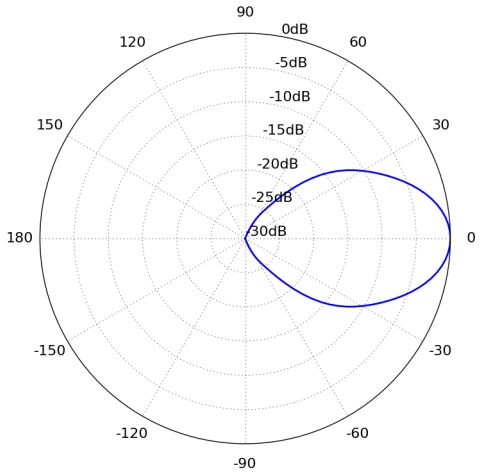
IS-5AC	
Dimensions With Horn Without Horn	 174 x 174 x 150 mm (6.85 x 6.85 x 5.91") 131 x 131 x 65 mm (5.16 x 5.16 x 2.56")
Weight With Horn Without Horn	 725.7 g (1.6 lb) 408.2 g (0.9 lb)
Max. Power Consumption	8.5W
Power Supply	24V, 0.5A Gigabit PoE Adapter
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)
Gain	14 dBi
Beamwidth	45° (Default Horn)
Networking Interface	(1) 10/100/1000 Ethernet Port
Processor Specs	MIPS 74 Kc
Memory	64 MB DDR2
LED	(1) Power
Mounting	Pole-Mount
Wind Loading	36 N @ 200 km/h (8.09 lbf @ 125 mph)
Wind Survivability	200 km/h (125 mph)
ESD/EMP Protection	± 24 kV Contact/Air
Operating Temperature	-40 to 70° C (-40 to 158° F)
Operating Humidity	5 to 95% Noncondensing
Certifications	FCC, IC, CE

Operating Frequency (MHz)		
Worldwide		5150 - 5875
USA	U-NII-1: 5150 - 5250	U-NII-3: 5725 - 5850

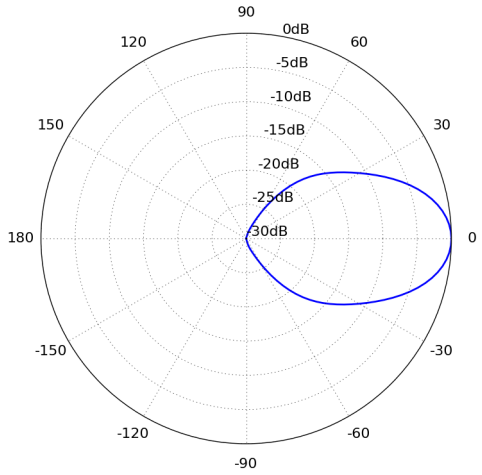
Management Radio (MHz)	
Worldwide	2412 - 2472
USA	2412 - 2462

IS-5AC Output Power: 25 dBm							
TX Power Specifications				**RX Power Specifications**			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	25 dBm	± 2 dB	**airMAX ac**	1x BPSK (½)	-96 dBm	± 2 dB
	2x QPSK (½)	25 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	25 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	25 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	25 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (⅔)	25 dBm	± 2 dB		6x 64QAM (⅔)	-83 dBm	± 2 dB
	6x 64QAM (¾)	24 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (⅚)	23 dBm	± 2 dB		6x 64QAM (⅚)	-74 dBm	± 2 dB
	8x 256QAM (¾)	21 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (⅚)	21 dBm	± 2 dB		8x 256QAM (⅚)	-65 dBm	± 2 dB

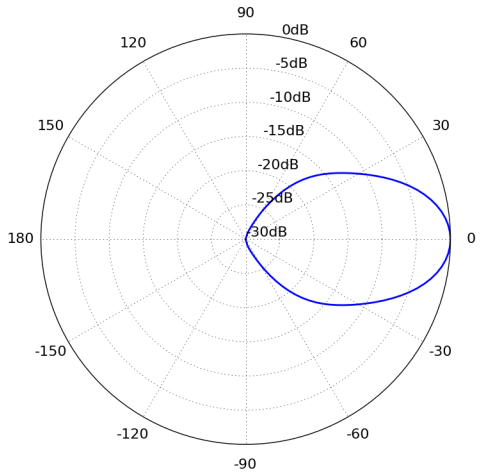
Vertical Azimuth



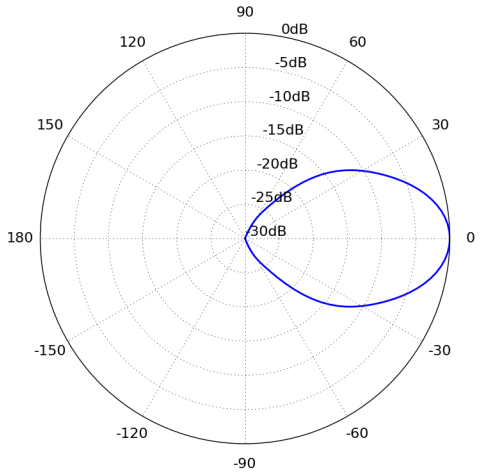
Vertical Elevation



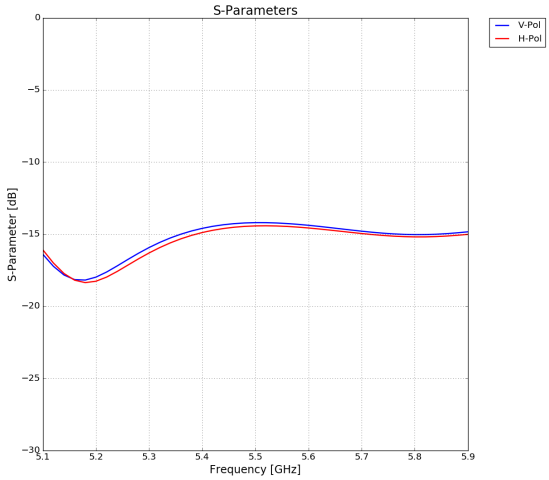
Horizontal Azimuth



Horizontal Elevation



Return Loss



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