NanoBeam® ac

airMAX® ac CPE with Dedicated Management Radio

Model: NBE-2AC-13

Uniform Beamwidth Maximizes Noise Immunity

airMAX ac Processor for Superior Performance

Dedicated Wi-Fi Radio for Management

UBIQUITI
N E T W O R K S

Overview

Ubiquiti Networks launches the latest generation of airMAX CPE (Customer Premises Equipment), the NanoBeam® 2AC with dedicated Wi-Fi management.

Improved Noise Immunity

The NanoBeam 2AC directs RF energy in a tighter beamwidth. With the focus in one direction, the NanoBeam 2AC blocks or spatially filters out noise, so noise immunity is improved. This feature is especially important in an area crowded with other RF signals of the same or similar frequency.

Integrated Design

The radio and antenna are combined to create a more efficient and compact CPE. The NanoBeam 2AC gets maximum gain out of the smallest footprint.

Providing high performance and an innovative form factor, the NanoBeam 2AC is versatile and cost-effective to deploy.

Software

airOS®8

airOS® 8 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: 10/20/40 MHz
  - PtMP: 10/20/40 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
- HTML5 Technology
- Optimization for Mobile Devices
- Detailed Device Statistics
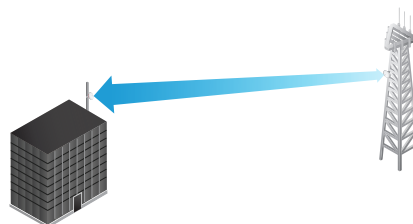- Comprehensive Array of Diagnostic Tools, including RF Diagnostics and airView® Spectrum Analyzer
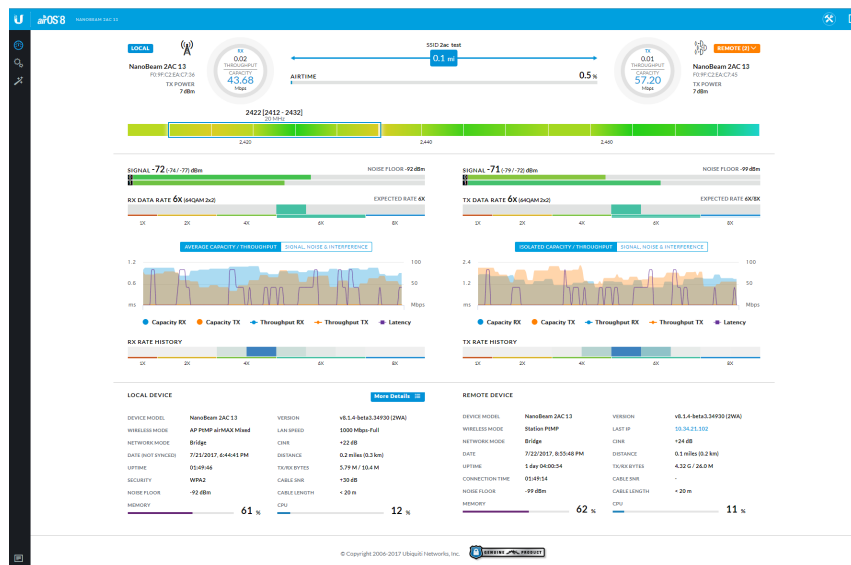
Application Examples

PtMP Client Links
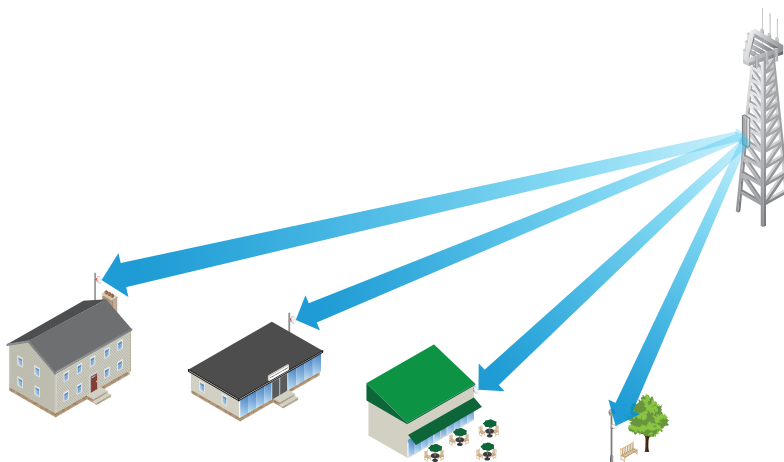
The NanoBeam 2AC used as a CPE device for each client in an airMAX PtMP network.

PtP Link

Use a NanoBeam 2AC on each side of a PtP link.

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 2.4 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
- Signal, Noise, and Interference (SNI) diagrams
- Carrier to Interference-plus-Noise Ratio (CINR) histograms

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: waveform, waterfall, and ambient noise level.

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

UNMS App

The NanoBeam 2AC integrates a separate Wi-Fi radio for fast and easy setup using your mobile device.

Accessing airOS via Wi-Fi

The UNMS™ 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 NanoBeam 2AC and offers various configuration options once you're connected or logged in.
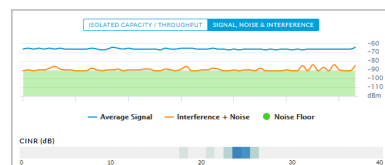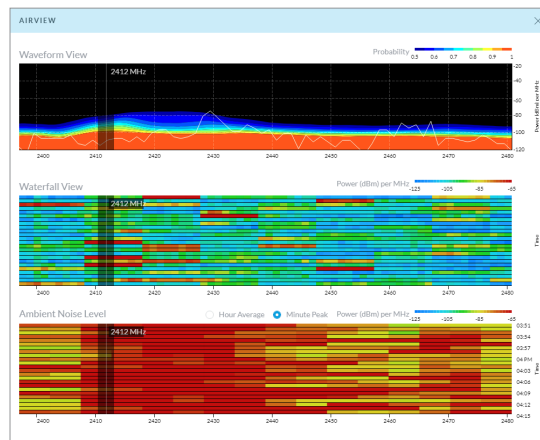
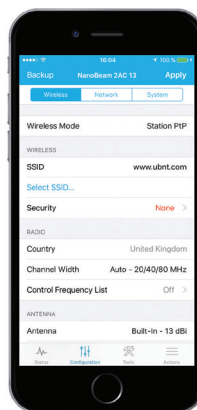**Multi-Radio Architecture**
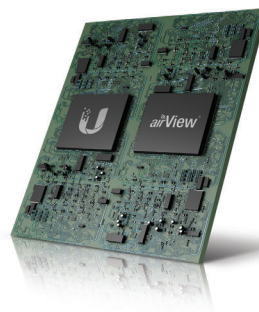
Constellation Diagrams
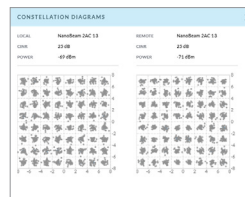
SNI Diagram and CINR Histogram

Dedicated Spectral Analysis

UNMS Configuration Screen

Technology

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, 2.4 GHz airMAX ac products support up to 330+ Mbps real TCP/IP throughput – more than double the throughput of standard airMAX products.
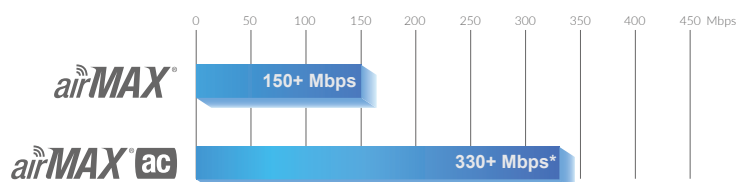
airMAX ac TDMA Technology
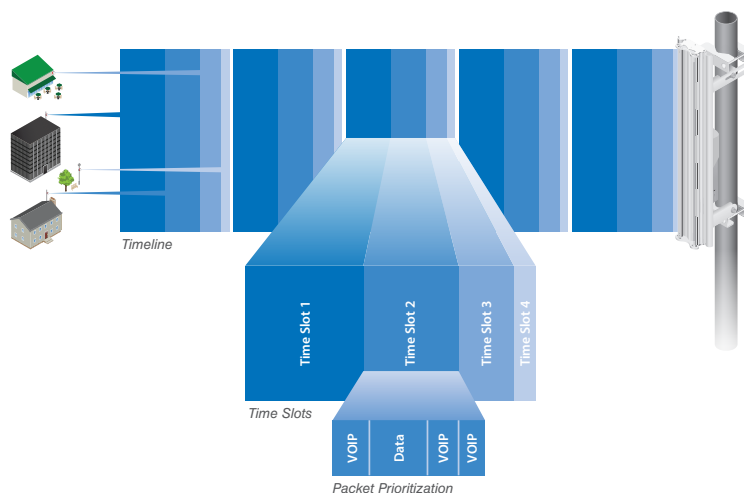
Up to 100 airMAX ac stations can be connected to an airMAX ac Sector; four airMAX ac stations are shown to illustrate the general concept.

airMAX Network Scalability
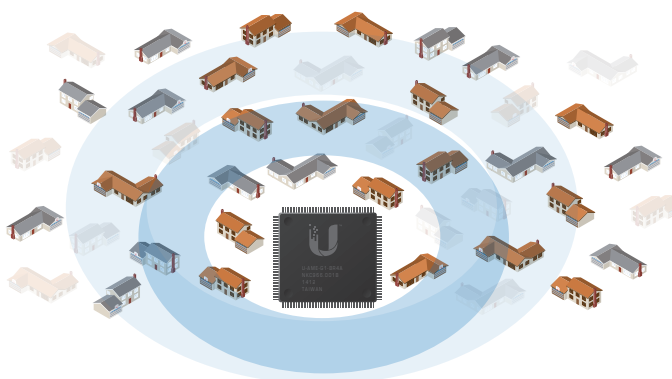
Superior Throughput Performance

* The 330+ Mbps throughput value is specific to 2.4 GHz airMAX ac products.

Hardware Overview

The NanoBeam 2AC features airMAX ac technology and a dedicated Wi-Fi radio for management.

Ease of Installation

- **Quick Installation** No fasteners are required for pole-mounting, and a single wall fastener (not included) is required for wall-mounting.
- **Convenient Alignment** The NanoBeam 2AC pivots on its ball joint mount for easy aiming.

Innovative Mechanical Design

- **Efficient Footprint** The radio and antenna are combined into a single body that takes up minimal space. The form factor features the highest gain for its size.
- **Aesthetics** The NanoBeam 2AC is small enough to blend discreetly into the background at a customer's location.
- **Versatile Mounting** The NanoBeam 2AC can be mounted in almost any position needed for line of sight.
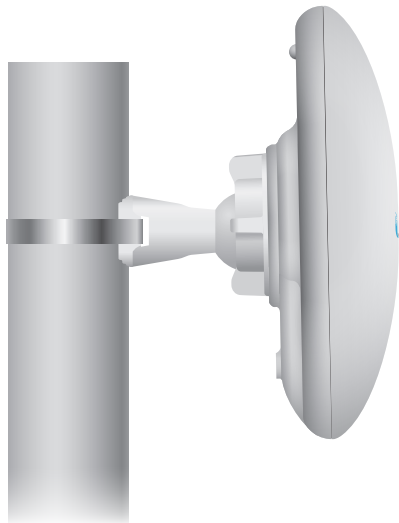
Pole-Mounted NanoBeam 2AC

Wall-Mounted NanoBeam 2AC

Lock Ring

Ball Joint Mount
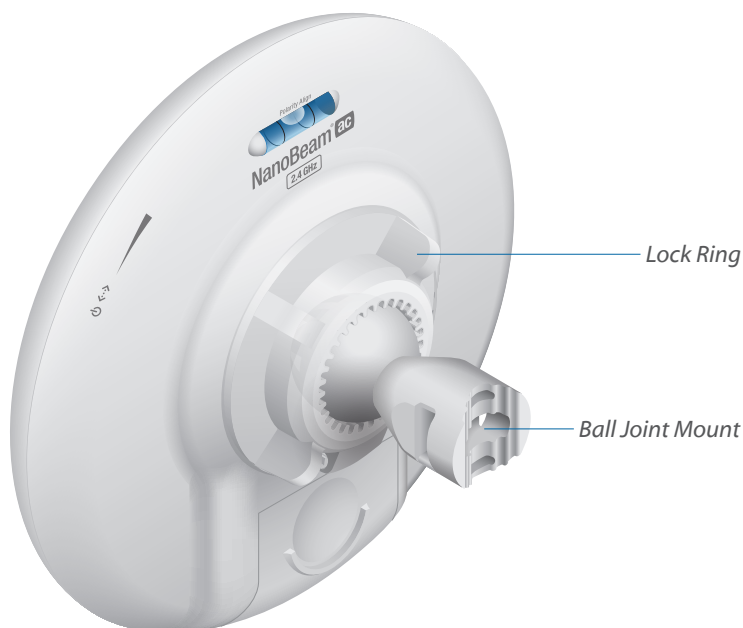
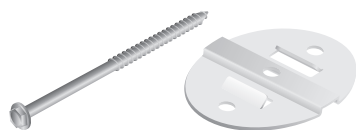*NanoBeam 2AC with Mounting Hardware*

Mounting Accessories

NanoBeam®
Wall Mount Kit

Model: NBE-WMK

A wall mount kit is available as an optional accessory to enhance stability for wall-mounting.

Wall-Mount Bracket Dimensions: 75mm x 55mm x 4mm

NanoBeam®
Window Mount

Model: NBE-19-WM

A suction cup mount is available as an optional accessory to mount the NanoBeam 2AC on a window.
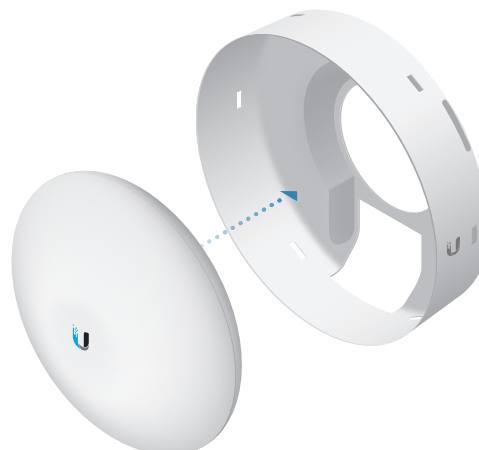

IsoBeam Accessory

IsoBeam™

Model: ISO-BEAM-19

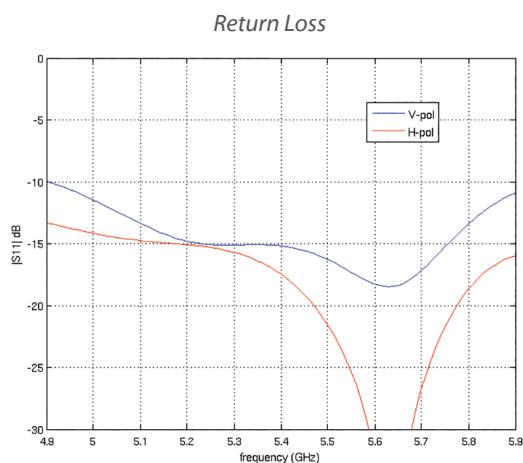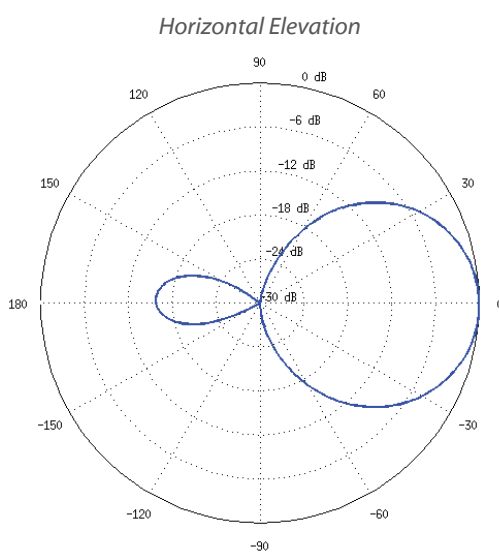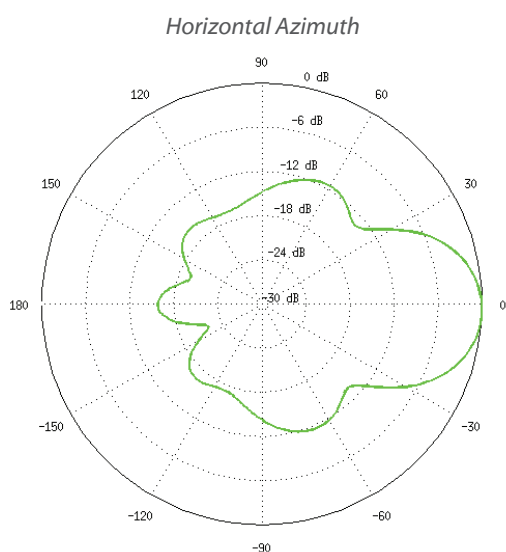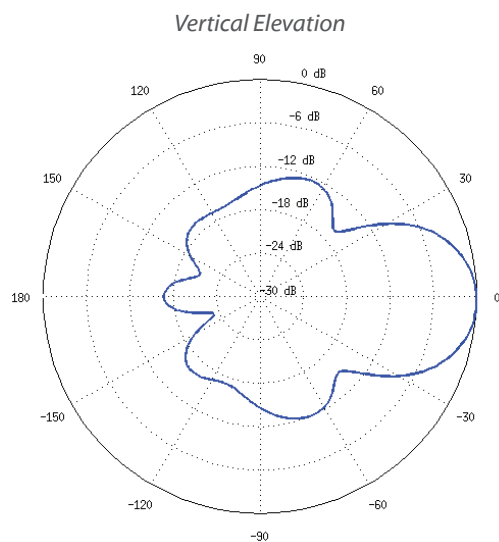An RF isolator shield is available as an optional accessory to enhance signal isolation.

Specifications

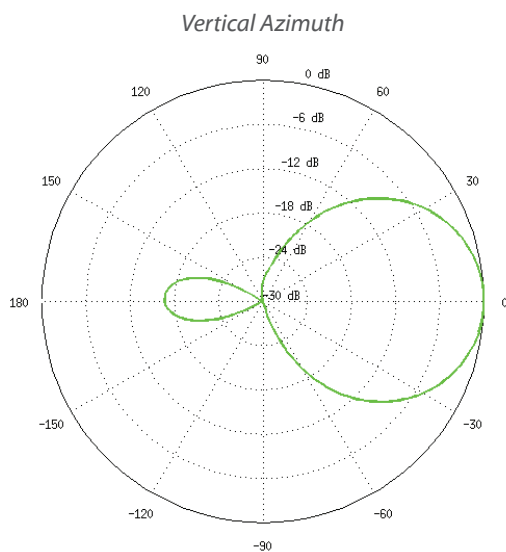| NBE-2AC-13		
Dimensions (Mount Included)		189 x 189 x 125 mm (7.44 x 7.44 x 4.92")
Weight (Mount Included)		0.530 kg (1.17 lb)
Power Supply		24V, 0.5A Gigabit PoE Adapter (Included)
Max. Power Consumption		7.5W
Gain		13 dBi
Networking Interface		(1) 10/100/1000 Ethernet Port Wi-Fi for Management
Processor Specs		Atheros MIPS 74Kc, 533 MHz
Memory		64 MB DDR2
LEDs		Power, Ethernet, (4) Signal Strength
Signal Strength LEDs		Software-Adjustable to Correspond to Custom RSSI Levels
Max. VSWR		1.5:1
Channel Sizes	PtP Mode	PtMP Mode
	10/20/40MHz	10/20/40 MHz
Polarization		Dual Linear
Enclosure		Outdoor UV Stabilized Plastic
Mounting		Pole-Mount (Kit Included), Wall-Mount
Wind Loading		45.4 N @ 200 km/h (10.2 lbf @ 125 mph)
Wind Survivability		200 km/h (125 mph)
ESD/EMP Protection		Air: ± 24 kV, Contact: ± 24 kV
RoHS Compliance		Yes
Salt Fog Test		IEC 68-2-11 (ASTM B117), Equivalent: MIL-STD-810 G Method 509.5
Vibration Test		IEC 68-2-6
Temperature Shock Test		IEC 68-2-14
UV Test		IEC 68-2-5 at 40° C (104° F), Equivalent: ETS 300 019-1-4
Wind-Driven Rain Test		ETS 300 019-1-4, Equivalent: MIL-STD-810 G Method 506.5
Operating Temperature		-40 to 70° C (-40 to 158° F)
Operating Humidity		5 to 95% Noncondensing
Certifications		CE, FCC, IC

Operating Frequency (MHz)	
Worldwide	2412 - 2472
USA	2412 - 2462

Management Radio (MHz)	
Worldwide	5150 - 5250
USA	U-NII-3: 5725 - 5850

NBE-2AC-13 Output Power: 27 dBm							
TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	27 dBm	± 2 dB	airMAX ac	1x BPSK (½)	-96 dBm	± 2 dB
	2x QPSK (½)	27 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	27 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	27 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	26 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)	22 dBm	± 2 dB		8x 256QAM (¾)	-71 dBm	± 2 dB
	8x 256QAM (⅚)	21 dBm	± 2 dB		8x 256QAM (⅚)	-68 dBm	± 2 dB

NanoBeam®ac

Vertical Azimuth

Vertical Elevation

Horizontal Azimuth

Horizontal Elevation

Return Loss

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