

# NanoBeam<sup>®</sup> M

High-Performance airMAX<sup>®</sup> Bridge

Models: NBE-M2-13, NBE-M5-16, NBE-M5-19

Uniform Beamwidth Maximizes Noise Immunity

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Innovative Mechanical Design

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High-Speed Processor for Superior Performance



# Overview

Starting with the first-generation NanoBridge®, Ubiquiti Networks® pioneered the all-in-one design for an airMAX® product functioning as a CPE (Customer Premises Equipment). Now Ubiquiti Networks launches the latest generation of CPE, the NanoBeam®.

## Improved Noise Immunity

Available for the 2.4 and 5 GHz frequency bands, the NanoBeam directs RF energy in a tighter beamwidth. With the focus in one direction, the NanoBeam 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 Ubiquiti Research and Development team combined the radio and antenna to create a more efficient and compact CPE. The NanoBeam gets maximum gain out of the smallest footprint.

Providing increased performance from its faster processor and innovative mechanical design at a low cost, the NanoBeam is extremely versatile and cost-effective to deploy.

## airMAX Technology Included

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. It provides significant performance improvements in latency, throughput, and scalability compared to all other outdoor systems in its class.

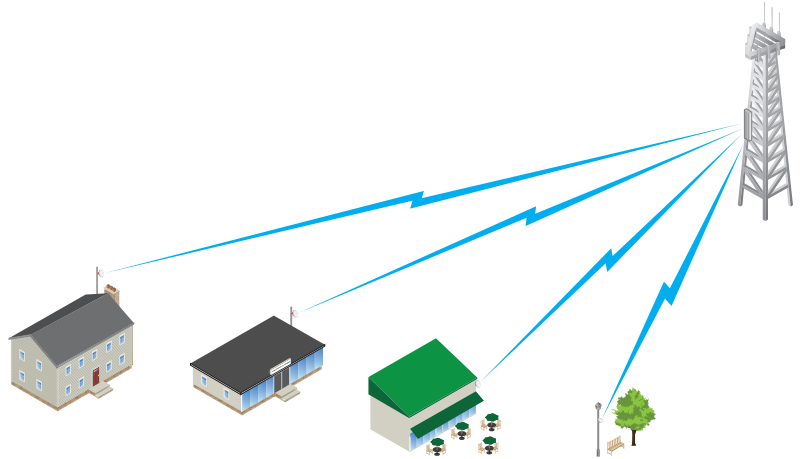
**Intelligent QoS** Priority is given to voice/video for seamless streaming.

**Scalability** High capacity and scalability.

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

## Application Examples

### PtMP Client Links



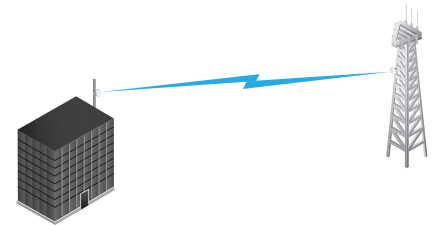
The NanoBeam used as a CPE device for each client in an airMAX PtMP network.

### Wireless Client



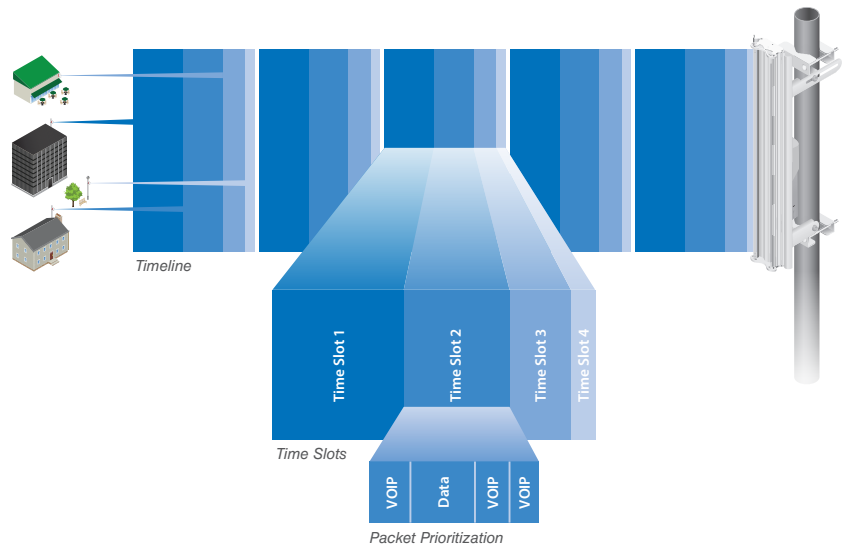
The NanoBeam as a powerful wireless client.

### PtP Link



Use a NanoBeam on each side of a PtP link.

## airMAX TDMA Technology



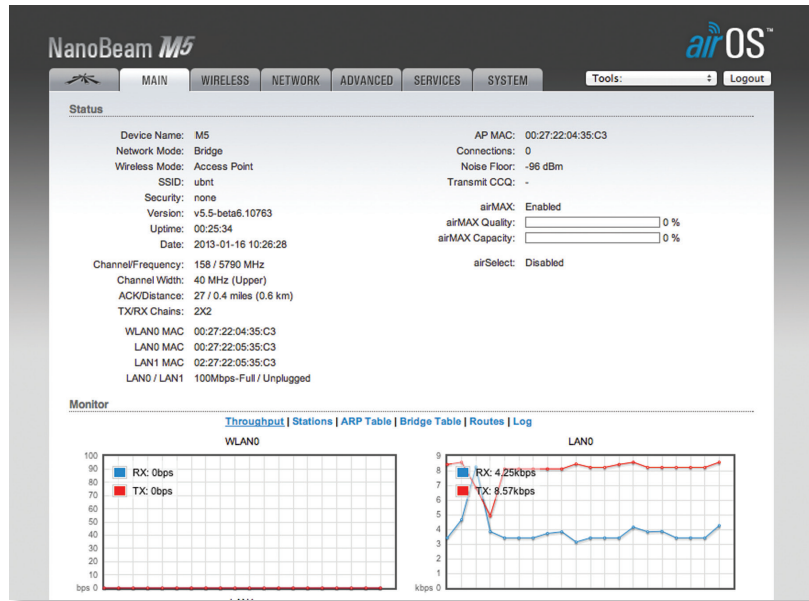
Up to 100 airMAX stations can be connected to an airMAX Sector; four airMAX stations are shown to illustrate the general concept.

# Software

## airOS®

airOS® is an intuitive, versatile, highly developed Ubiquiti firmware technology. It is exceptionally intuitive and was designed to require no training to operate. Behind the user interface is a powerful firmware architecture, which enables high-performance, outdoor multi-point networking.

- Protocol Support
- Ubiquiti Channelization
- Spectral Width Adjustment
- ACK Auto-Timing
- AAP Technology
- Multi-Language Support



## airView®

Integrated on all Ubiquiti M products, airView® provides advanced spectrum analyzer functionality: waterfall, waveform, and real-time spectral views allow operators to identify noise signatures and plan their networks to minimize noise interference.

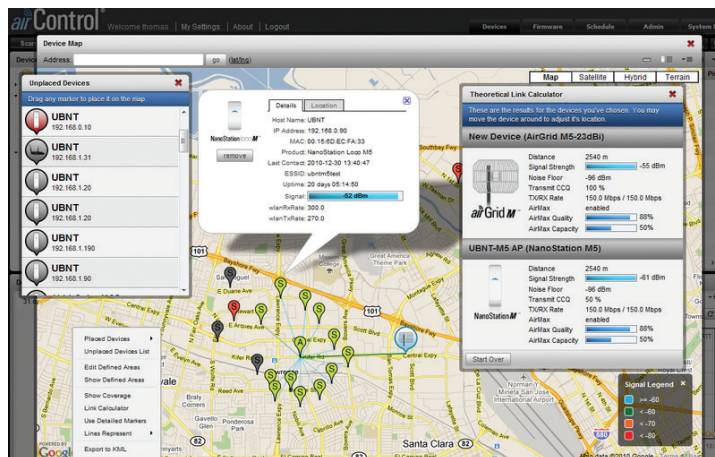
- **Waterfall** Aggregate energy over time for each frequency.
- **Waveform** Aggregate energy collected.
- **Real-time** Energy is shown in real time as a function of frequency.
- **Recording** Automate airView to record and report results.



## airControl®

airControl® is a powerful and intuitive, web-based server network management application, which allows operators to centrally manage entire networks of Ubiquiti devices.

- Network Map
- Monitor Device Status
- Mass Firmware Upgrade
- Web UI Access
- Manage Groups of Devices
- Task Scheduling



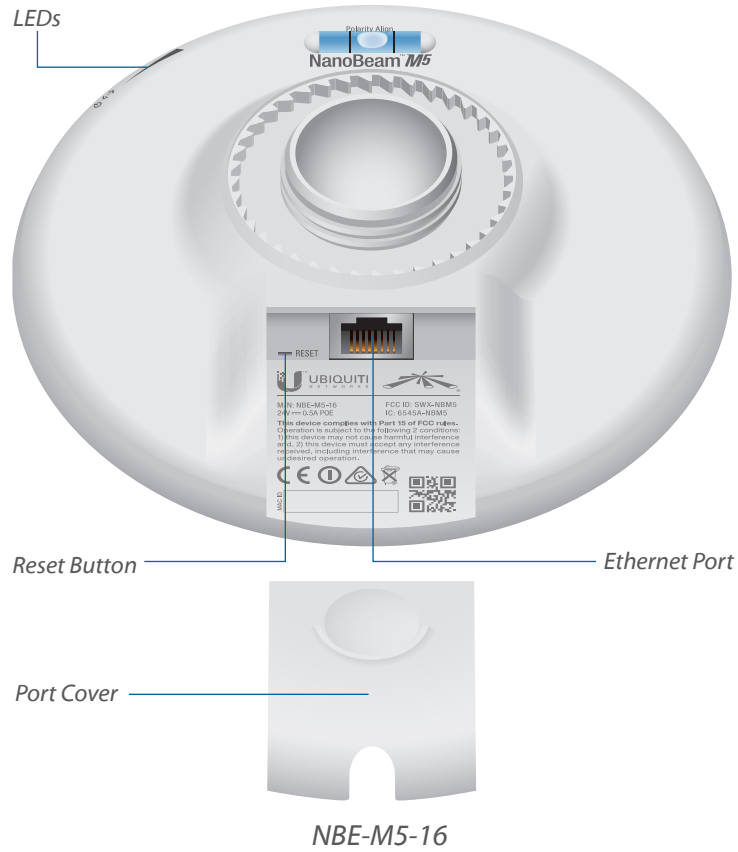
# Hardware Overview

## Innovative Mechanical Design

- **All-in-one design** The NanoBeam provides both the radio and antenna in the smallest possible footprint.
- **Quick and easy installation** No fasteners are required for pole-mounting, and a single wall fastener (not included) is required for wall-mounting.
- **Convenient alignment** The NanoBeam pivots on its ball joint for easy aiming.

## Compact Form Factor

- **Efficient footprint** The radio and antenna are combined into a single body that takes up minimal space.
- **Versatile mounting** The NanoBeam can be mounted in almost any position needed for line of sight.
- **Aesthetics** The NanoBeam is small enough to blend discreetly into the background at a customer's location.



## 2.4 GHz Model



## NanoBeam<sup>®</sup> M2

Model	Frequency	Gain
NBE-M2-13	2.4 GHz	13 dBi



## 5 GHz Models



### NanoBeam<sup>®</sup> M5

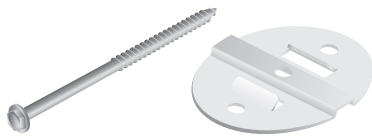
Model	Frequency	Gain
NBE-M5-19	5 GHz	19 dBi

Model	Frequency	Gain
NBE-M5-16	5 GHz	16 dBi



### NanoBeam<sup>®</sup> M5

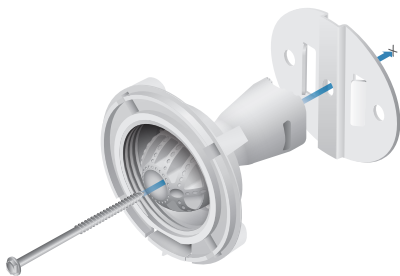
Model	Frequency	Gain
NBE-M5-19	5 GHz	19 dBi



### NanoBeam<sup>®</sup> Wall Mount Kit

Model	NBE-M2-13	NBE-M5-19	NBE-M5-16
NBE-WMK	✓	✓	✓

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



*Installation Using the NanoBeam Wall Mount Kit*

# Specifications

System and Regulatory/Compliance			
Model	NBE-M2-13	NBE-M5-16	NBE-M5-19
Processor Specs	Atheros MIPS 74Kc, 560 MHz		
Memory	64 MB DDR2, 8 MB Flash		
Networking Interface	(1) 10/100 Ethernet Port		
Wireless Approvals	FCC, IC, CE		
RoHS Compliance	Yes		

Physical/Electrical/Environmental			
Model	NBE-M2-13	NBE-M5-16	NBE-M5-19
Dimensions	189 x 189 x 125 mm (7.44 x 7.44 x 4.92 in)	140 x 140 x 54 mm (5.51 x 5.51 x 2.13 in)	189 x 189 x 125 mm (7.44 x 7.44 x 4.92 in)
Weight	0.530 kg (1.17 lb)	0.320 kg (0.71 lb)	0.530 kg (1.17 lb)
Power Supply	24V, 0.5A PoE	24V, 0.5A PoE	24V, 0.5A PoE
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)	Passive PoE (Pairs 4, 5+; 7, 8 Return)	Passive PoE (Pairs 4, 5+; 7, 8 Return)
Max. Power Consumption	6W	6W	8W
Gain	13 dBi	16 dBi	19 dBi
Wind Loading	45.4 N @ 200 km/h (10.2 lbf @ 125 mph)	21.4 N @ 200 km/h (4.8 lbf @ 125 mph)	45.4 N @ 200 km/h (10.2 lbf @ 125 mph)
Wind Survivability	200 km/h (125 mph)		
LEDs	(1) Power, (1) LAN, (4) WLAN		
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels		
Channel Sizes	5/8/10/20/30/40 MHz		
Polarization	Dual Linear		
Enclosure	Outdoor UV Stabilized Plastic		
Mounting	Pole-Mount (Kit Included), Wall-Mount		
ESD/EMP Protection	Air: ± 24 kV, Contact: ± 24 kV		
Operating Temperature	-40 to 80° C (-40 to 176° F)	-40 to 70° C (-40 to 158° F)	
Operating Humidity	5 to 95% Noncondensing		
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 Frequency			
Model	NBE-M2-13	NBE-M5-16	NBE-M5-19
Operating Frequency	2405 - 2475 MHz	Worldwide: 5170 - 5875 MHz USA: 5725 - 5850 MHz	

# Specifications

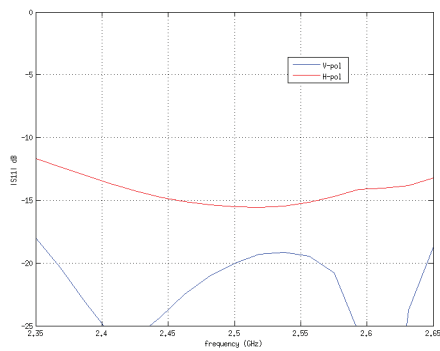
NBE-M2-13 Output Power: 28 dBm

TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
<b>802.11g</b>	1 - 24 Mbps	28 dBm	± 2 dB	<b>802.11g</b>	1 - 24 Mbps	-94 dBm Min.	± 2 dB
	36 Mbps	26 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	25 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	24 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
<b>802.11n/airMAX</b>	MCS0	28 dBm	± 2 dB	<b>802.11n/airMAX</b>	MCS0	-96 dBm	± 2 dB
	MCS1	28 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	27 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	26 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	25 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	24 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	22 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	28 dBm	± 2 dB		MCS8	-96 dBm	± 2 dB
	MCS9	28 dBm	± 2 dB		MCS9	-95 dBm	± 2 dB
	MCS10	27 dBm	± 2 dB		MCS10	-92 dBm	± 2 dB
	MCS11	26 dBm	± 2 dB		MCS11	-90 dBm	± 2 dB
	MCS12	25 dBm	± 2 dB		MCS12	-86 dBm	± 2 dB
	MCS13	24 dBm	± 2 dB		MCS13	-83 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-77 dBm	± 2 dB
MCS15	22 dBm	± 2 dB	MCS15	-74 dBm	± 2 dB		

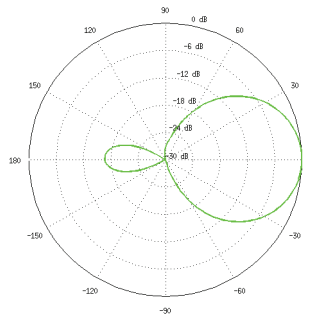
## NBE-M2-13 Antenna Information

Gain	13 dBi
Max. VSWR	1.7:1

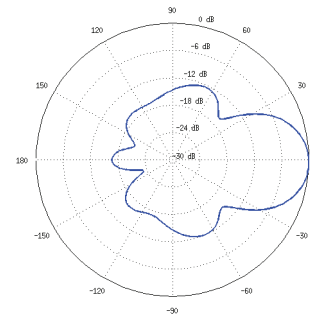
Return Loss



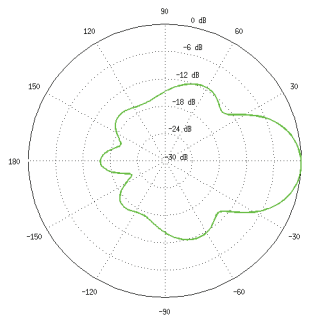
Vertical Azimuth



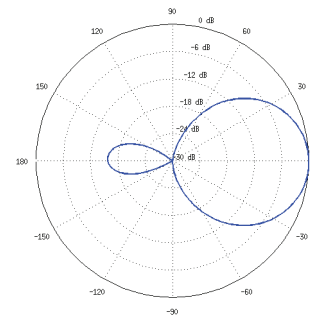
Vertical Elevation



Horizontal Azimuth



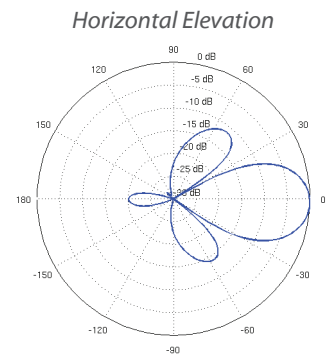
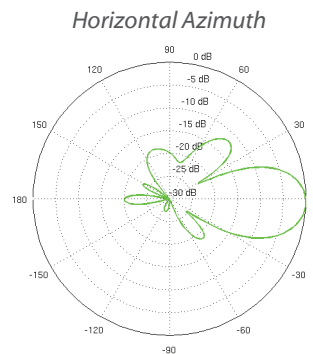
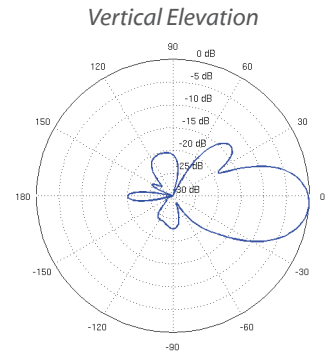
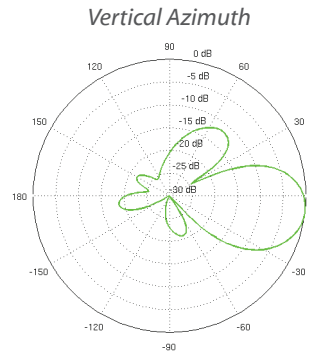
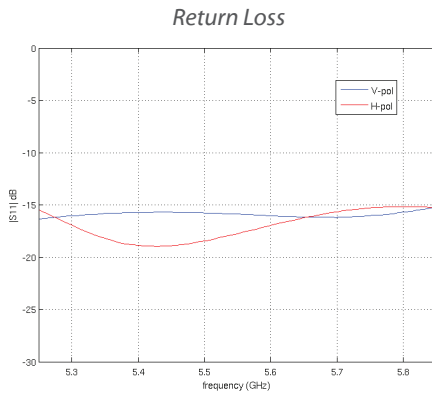
Horizontal Elevation



# Specifications

NBE-M5-16 Output Power: 26 dBm							
TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
<b>802.11a</b>	6 - 24 Mbps	26 dBm	± 2 dB	<b>802.11a</b>	6 - 24 Mbps	-94 dBm Min.	± 2 dB
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	24 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	23 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
<b>802.11n/airMAX</b>	MCS0	26 dBm	± 2 dB	<b>802.11n/airMAX</b>	MCS0	-96 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	25 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	24 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	23 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	23 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	26 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	25 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	25 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	25 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	24 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	23 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
MCS15	23 dBm	± 2 dB	MCS15	-75 dBm	± 2 dB		

NBE-M5-16 Antenna Information	
Gain	16 dBi
Max. VSWR	1.5:1

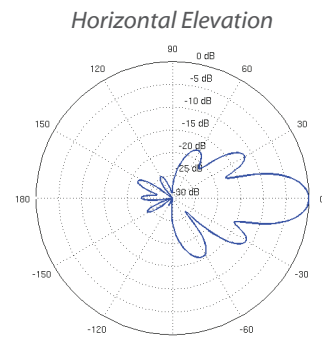
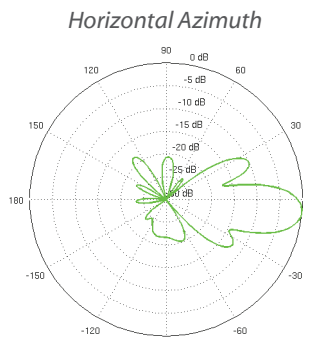
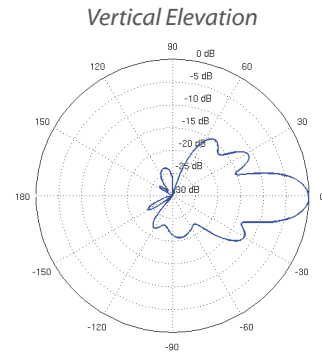
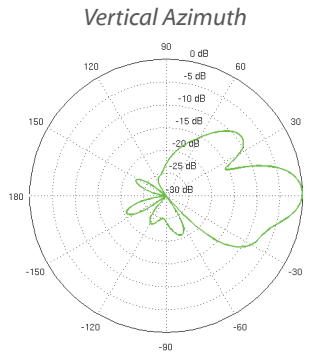
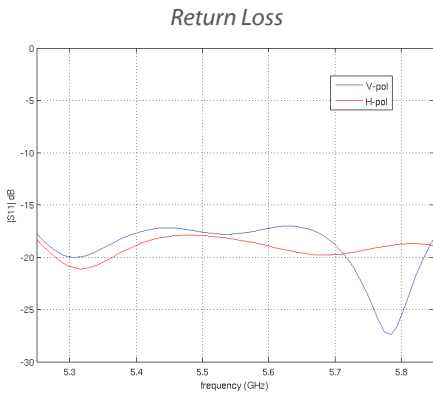




# Specifications

NBE-M5-19 Output Power: 26 dBm							
TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
<b>802.11a</b>	6 - 24 Mbps	26 dBm	± 2 dB	<b>802.11a</b>	6 - 24 Mbps	-94 dBm Min.	± 2 dB
	36 Mbps	25 dBm	± 2 dB		36 Mbps	-80 dBm	± 2 dB
	48 Mbps	24 dBm	± 2 dB		48 Mbps	-77 dBm	± 2 dB
	54 Mbps	23 dBm	± 2 dB		54 Mbps	-75 dBm	± 2 dB
<b>802.11n/airMAX</b>	MCS0	26 dBm	± 2 dB	<b>802.11n/airMAX</b>	MCS0	-96 dBm	± 2 dB
	MCS1	25 dBm	± 2 dB		MCS1	-95 dBm	± 2 dB
	MCS2	25 dBm	± 2 dB		MCS2	-92 dBm	± 2 dB
	MCS3	25 dBm	± 2 dB		MCS3	-90 dBm	± 2 dB
	MCS4	24 dBm	± 2 dB		MCS4	-86 dBm	± 2 dB
	MCS5	23 dBm	± 2 dB		MCS5	-83 dBm	± 2 dB
	MCS6	23 dBm	± 2 dB		MCS6	-77 dBm	± 2 dB
	MCS7	23 dBm	± 2 dB		MCS7	-74 dBm	± 2 dB
	MCS8	26 dBm	± 2 dB		MCS8	-95 dBm	± 2 dB
	MCS9	25 dBm	± 2 dB		MCS9	-93 dBm	± 2 dB
	MCS10	25 dBm	± 2 dB		MCS10	-90 dBm	± 2 dB
	MCS11	25 dBm	± 2 dB		MCS11	-87 dBm	± 2 dB
	MCS12	24 dBm	± 2 dB		MCS12	-84 dBm	± 2 dB
	MCS13	23 dBm	± 2 dB		MCS13	-79 dBm	± 2 dB
	MCS14	23 dBm	± 2 dB		MCS14	-78 dBm	± 2 dB
MCS15	23 dBm	± 2 dB	MCS15	-75 dBm	± 2 dB		

NBE-M5-19 Antenna Information	
Gain	19 dBi
Max. VSWR	1.5:1



Specifications are subject to change. Ubiquiti products are sold with a limited warranty described at: [www.ubnt.com/support/warranty](http://www.ubnt.com/support/warranty)  
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