



## PowerBeam™ M5 ISO

5 GHz airMAX® Bridge with RF Isolated Reflector

Models: PBE-M5-300-ISO, PBE-M5-400-ISO

Uniform Beamwidth Maximizes Noise Immunity

Integrated Isolator Design Improves RF Isolation

High-Speed Processor for Superior Performance



# Overview

Ubiquiti Networks launches the PowerBeam™ ISO, an airMAX Bridge that is ideal for deployments requiring maximum performance and RF isolation.

## Improved Noise Immunity

The PowerBeam ISO directs RF energy in a tighter beamwidth, and its integrated isolator design improves RF isolation to spatially filter out interference. With its combination of focused beam directivity and RF isolation, the PowerBeam ISO blocks noise to improve noise immunity. This is especially important in an area crowded with other RF signals of the same or similar frequency.

## Integrated Radio Design

Ubiquiti's InnerFeed™ technology integrates the radio into the feedhorn of an antenna, so there is no need for a cable. This improves performance because it eliminates cable losses.

Providing high performance and innovative mechanical design at a low cost, the PowerBeam ISO 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, so airMAX technology provides performance improvements in latency, noise immunity, scalability, and throughput compared to other outdoor systems in its class.

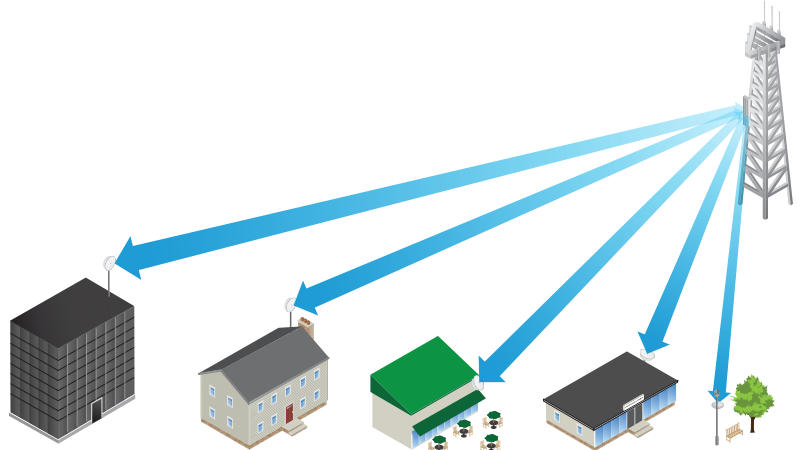
**Intelligent QoS** Priority assigned to voice/video for seamless streaming.

**Scalability** High capacity and scalability.

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

## Application Examples

### PtMP Client Links



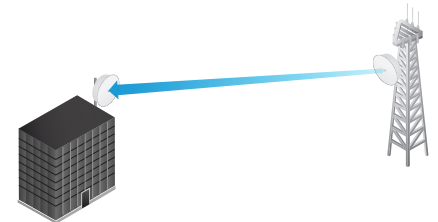
The PowerBeam ISO used as a CPE device for each client in an airMAX PtMP network.

### Wireless Client



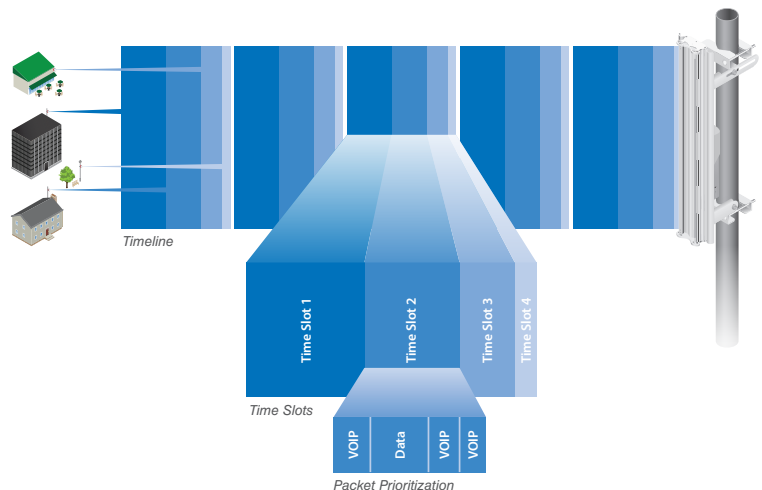
The PowerBeam ISO as a powerful wireless client.

### PtP Link



Use a PowerBeam ISO 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®

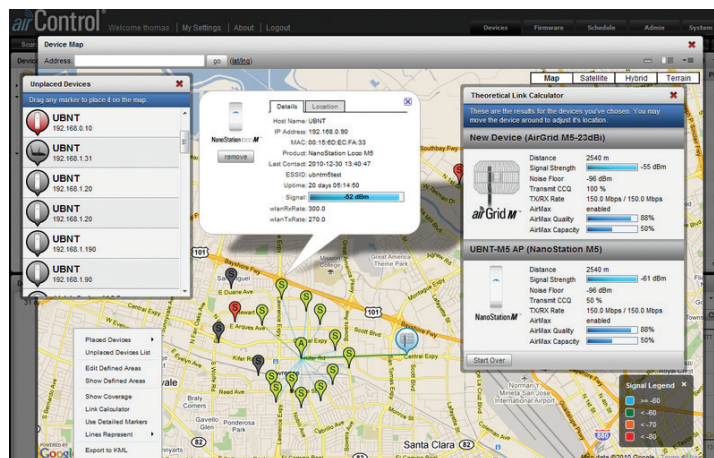
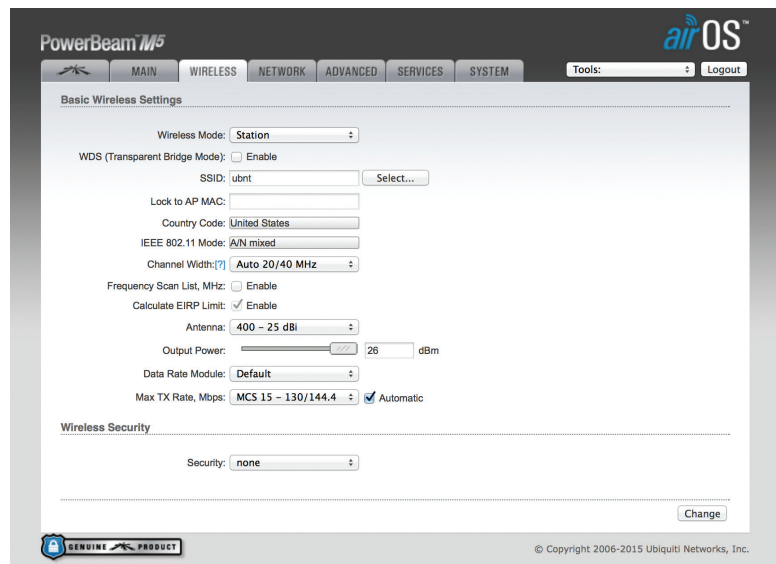
Integrated on all Ubiquiti M products, airView® provides advanced spectrum analyzer functionality: waterfall, waveform, and real-time spectral views allow operators to identify noise signatures and plan their networks to minimize noise interference.

- **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

- **Metal-plated interior of rear housing** Enhances RF shielding.
- **Built-in mechanical tilt** The mounting bracket offers  $\pm 20^\circ$  of tilt.
- **Convenient pole-mounting** Only a single wrench is needed to mount the PowerBeam ISO on a pole.

## Breakthrough RF Isolation

The integrated isolator design spatially filters out interference, so the PowerBeam ISO delivers improved noise immunity in co-location deployments.

Compare the two near-field plots below, and note the superior performance of the integrated RF isolator.

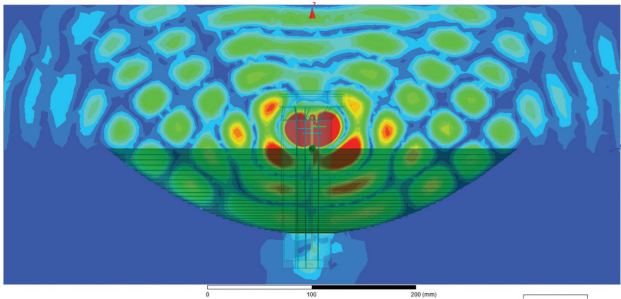
## Industrial-Strength Construction

- **Fasteners** GEOMET-coated for improved corrosion resistance when compared with zinc-plated fasteners.
- **Dish and brackets** Made of galvanized steel that is powder-coated for superior corrosion resistance.
- **Protective radome** Shields the radio from nature's harshest elements.

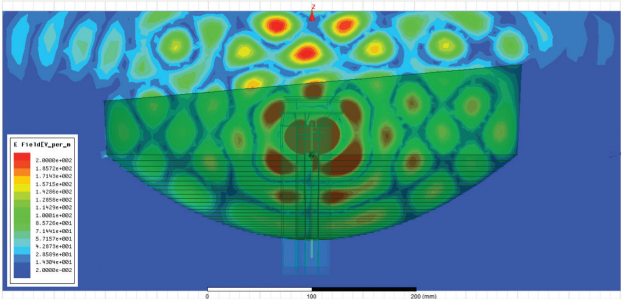
Both near-field plots are displayed in watts and use a linear scale. The strength of the electromagnetic field is color-coded:

- **Red:** Highest strength
- **Green:** Medium strength
- **Indigo:** Lowest strength

Without Integrated RF Isolator



With Integrated RF Isolator



## Models

Using airMAX technology, the PowerBeam ISO supports up to 150+ Mbps real TCP/IP throughput.



### PowerBeam™ M5 ISO

| Model          | Frequency | Gain   | Dish Reflector |
|----------------|-----------|--------|----------------|
| PBE-M5-300-ISO | 5 GHz     | 22 dBi | 300 mm         |

### PowerBeam™ M5 ISO

| Model          | Frequency | Gain   | Dish Reflector |
|----------------|-----------|--------|----------------|
| PBE-M5-400-ISO | 5 GHz     | 25 dBi | 400 mm         |

# Specifications

| PBE-M5-300-ISO System and Regulatory/Compliance |                            |
|-------------------------------------------------|----------------------------|
| 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                        |

| PBE-M5-300-ISO Physical/Electrical/Environmental |                                                                 |
|--------------------------------------------------|-----------------------------------------------------------------|
| Dimensions                                       | 364 x 364 x 276 mm (14.33 x 14.33 x 10.87")                     |
| Weight                                           | 2.55 kg (5.62 lb)                                               |
| Power Supply                                     | 24V, 0.5A PoE                                                   |
| Power Method                                     | Passive PoE (Pairs 4, 5+; 7, 8 Return)                          |
| Supported Voltage Range                          | 20-26VDC                                                        |
| Max. Power Consumption                           | 6W                                                              |
| Gain                                             | 22 dBi                                                          |
| Operating Frequency<br>Worldwide<br>USA          | 5170 - 5875 MHz<br>5725 - 5850 MHz                              |
| Wind Loading                                     | 210 N @ 200 km/h (47 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                                         |
| ESD/EMP Protection                               | Air: $\pm 24$ kV, Contact: $\pm 24$ kV                          |
| Operating Temperature                            | -40 to 70° C (-40 to 158° F)                                    |
| Operating Humidity                               | 5 to 95% Non-Condensing                                         |
| 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         |

# Specifications

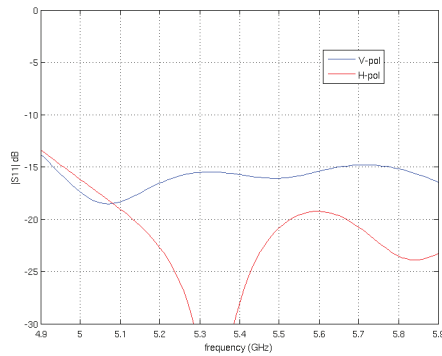
PBE-M5-300-ISO Output Power: 24 dBm

| TX Power Specifications |             |         |           | RX Power Specifications |             |              |           |
|-------------------------|-------------|---------|-----------|-------------------------|-------------|--------------|-----------|
| Modulation              | Data Rate   | Avg. TX | Tolerance | Modulation              | Data Rate   | Sensitivity  | Tolerance |
| <b>802.11a</b>          | 6 - 24 Mbps | 24 dBm  | ± 2 dB    | <b>802.11a</b>          | 6 - 24 Mbps | -94 dBm Min. | ± 2 dB    |
|                         | 36 Mbps     | 24 dBm  | ± 2 dB    |                         | 36 Mbps     | -80 dBm      | ± 2 dB    |
|                         | 48 Mbps     | 23 dBm  | ± 2 dB    |                         | 48 Mbps     | -77 dBm      | ± 2 dB    |
|                         | 54 Mbps     | 22 dBm  | ± 2 dB    |                         | 54 Mbps     | -75 dBm      | ± 2 dB    |
| <b>802.11n/airMAX</b>   | MCS0        | 24 dBm  | ± 2 dB    | <b>802.11n/airMAX</b>   | MCS0        | -96 dBm      | ± 2 dB    |
|                         | MCS1        | 24 dBm  | ± 2 dB    |                         | MCS1        | -95 dBm      | ± 2 dB    |
|                         | MCS2        | 23 dBm  | ± 2 dB    |                         | MCS2        | -92 dBm      | ± 2 dB    |
|                         | MCS3        | 23 dBm  | ± 2 dB    |                         | MCS3        | -90 dBm      | ± 2 dB    |
|                         | MCS4        | 22 dBm  | ± 2 dB    |                         | MCS4        | -86 dBm      | ± 2 dB    |
|                         | MCS5        | 21 dBm  | ± 2 dB    |                         | MCS5        | -83 dBm      | ± 2 dB    |
|                         | MCS6        | 20 dBm  | ± 2 dB    |                         | MCS6        | -77 dBm      | ± 2 dB    |
|                         | MCS7        | 20 dBm  | ± 2 dB    |                         | MCS7        | -74 dBm      | ± 2 dB    |
|                         | MCS8        | 24 dBm  | ± 2 dB    |                         | MCS8        | -96 dBm      | ± 2 dB    |
|                         | MCS9        | 24 dBm  | ± 2 dB    |                         | MCS9        | -95 dBm      | ± 2 dB    |
|                         | MCS10       | 23 dBm  | ± 2 dB    |                         | MCS10       | -92 dBm      | ± 2 dB    |
|                         | MCS11       | 23 dBm  | ± 2 dB    |                         | MCS11       | -90 dBm      | ± 2 dB    |
|                         | MCS12       | 22 dBm  | ± 2 dB    |                         | MCS12       | -86 dBm      | ± 2 dB    |
|                         | MCS13       | 21 dBm  | ± 2 dB    |                         | MCS13       | -83 dBm      | ± 2 dB    |
|                         | MCS14       | 20 dBm  | ± 2 dB    |                         | MCS14       | -77 dBm      | ± 2 dB    |
|                         | MCS15       | 20 dBm  | ± 2 dB    |                         | MCS15       | -74 dBm      | ± 2 dB    |

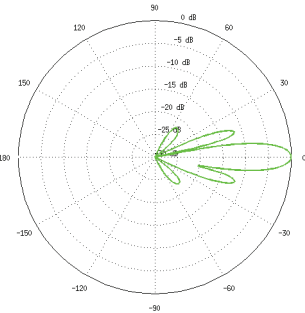
PBE-M5-300-ISO Antenna Information

|                              |        |
|------------------------------|--------|
| Gain                         | 22 dBi |
| Max. VSWR                    | 1.5:1  |
| Built-In Mechanical Downtilt | ± 20°  |

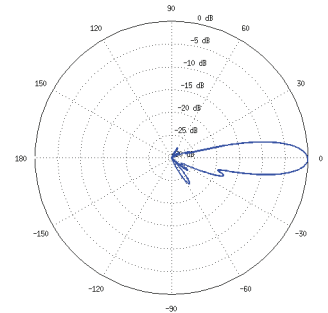
Return Loss



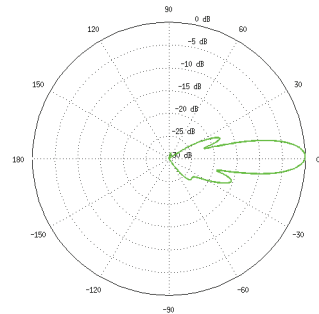
Vertical Azimuth



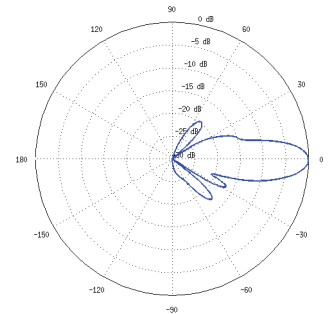
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation



# Specifications

| PBE-M5-400-ISO System and Regulatory/Compliance |                               |
|-------------------------------------------------|-------------------------------|
| Processor Specs                                 | Atheros MIPS 74Kc, 560 MHz    |
| Memory                                          | 64 MB DDR2, 8 MB Flash        |
| Networking Interface                            | (1) 10/100/1000 Ethernet Port |
| Wireless Approvals                              | FCC, IC, CE                   |
| RoHS Compliance                                 | Yes                           |

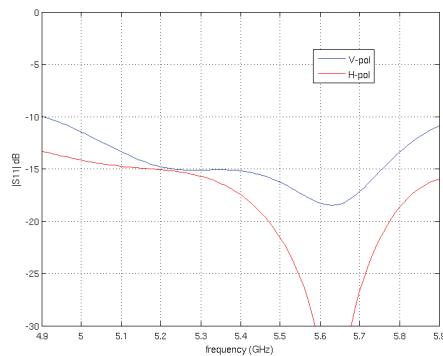
| PBE-M5-400-ISO Physical/Electrical/Environmental |                                                                 |
|--------------------------------------------------|-----------------------------------------------------------------|
| Dimensions                                       | 459 x 459 x 261 mm (18.07 x 18.07 x 10.28")                     |
| Weight                                           | 3.22 kg (7.10 lb)                                               |
| Power Supply                                     | 24V, 0.5A Gigabit PoE                                           |
| Power Method                                     | Passive PoE (Pairs 4, 5+; 7, 8 Return)                          |
| Supported Voltage Range                          | 18-26VDC                                                        |
| Max. Power Consumption                           | 8W                                                              |
| Gain                                             | 25 dBi                                                          |
| Operating Frequency<br>Worldwide<br>USA          | 5170 - 5875 MHz<br>5725 - 5850 MHz                              |
| Wind Loading                                     | 390 N @ 200 km/h (88 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                                         |
| ESD/EMP Protection                               | Air: $\pm 24$ kV, Contact: $\pm 24$ kV                          |
| Operating Temperature                            | -40 to 70° C (-40 to 158° F)                                    |
| Operating Humidity                               | 5 to 95% Non-Condensing                                         |
| 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         |

# Specifications

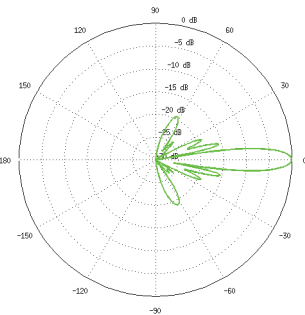
| PBE-M5-400-ISO Output Power: 24 dBm |             |         |           |                         |             |              |           |
|-------------------------------------|-------------|---------|-----------|-------------------------|-------------|--------------|-----------|
| TX Power Specifications             |             |         |           | RX Power Specifications |             |              |           |
| Modulation                          | Data Rate   | Avg. TX | Tolerance | Modulation              | Data Rate   | Sensitivity  | Tolerance |
| <b>802.11a</b>                      | 6 - 24 Mbps | 24 dBm  | ± 2 dB    | <b>802.11a</b>          | 6 - 24 Mbps | -94 dBm Min. | ± 2 dB    |
|                                     | 36 Mbps     | 24 dBm  | ± 2 dB    |                         | 36 Mbps     | -80 dBm      | ± 2 dB    |
|                                     | 48 Mbps     | 23 dBm  | ± 2 dB    |                         | 48 Mbps     | -77 dBm      | ± 2 dB    |
|                                     | 54 Mbps     | 22 dBm  | ± 2 dB    |                         | 54 Mbps     | -75 dBm      | ± 2 dB    |
| <b>802.11n/airMAX</b>               | MCS0        | 24 dBm  | ± 2 dB    | <b>802.11n/airMAX</b>   | MCS0        | -96 dBm      | ± 2 dB    |
|                                     | MCS1        | 24 dBm  | ± 2 dB    |                         | MCS1        | -95 dBm      | ± 2 dB    |
|                                     | MCS2        | 23 dBm  | ± 2 dB    |                         | MCS2        | -92 dBm      | ± 2 dB    |
|                                     | MCS3        | 23 dBm  | ± 2 dB    |                         | MCS3        | -90 dBm      | ± 2 dB    |
|                                     | MCS4        | 22 dBm  | ± 2 dB    |                         | MCS4        | -86 dBm      | ± 2 dB    |
|                                     | MCS5        | 21 dBm  | ± 2 dB    |                         | MCS5        | -83 dBm      | ± 2 dB    |
|                                     | MCS6        | 20 dBm  | ± 2 dB    |                         | MCS6        | -77 dBm      | ± 2 dB    |
|                                     | MCS7        | 20 dBm  | ± 2 dB    |                         | MCS7        | -74 dBm      | ± 2 dB    |
|                                     | MCS8        | 24 dBm  | ± 2 dB    |                         | MCS8        | -96 dBm      | ± 2 dB    |
|                                     | MCS9        | 24 dBm  | ± 2 dB    |                         | MCS9        | -95 dBm      | ± 2 dB    |
|                                     | MCS10       | 23 dBm  | ± 2 dB    |                         | MCS10       | -92 dBm      | ± 2 dB    |
|                                     | MCS11       | 23 dBm  | ± 2 dB    |                         | MCS11       | -90 dBm      | ± 2 dB    |
|                                     | MCS12       | 22 dBm  | ± 2 dB    |                         | MCS12       | -86 dBm      | ± 2 dB    |
|                                     | MCS13       | 21 dBm  | ± 2 dB    |                         | MCS13       | -83 dBm      | ± 2 dB    |
|                                     | MCS14       | 20 dBm  | ± 2 dB    |                         | MCS14       | -77 dBm      | ± 2 dB    |
|                                     | MCS15       | 20 dBm  | ± 2 dB    |                         | MCS15       | -74 dBm      | ± 2 dB    |

| PBE-M5-400-ISO Antenna Information |        |
|------------------------------------|--------|
| Gain                               | 25 dBi |
| Max. VSWR                          | 1.5:1  |
| Built-In Mechanical Downtilt       | ± 20°  |

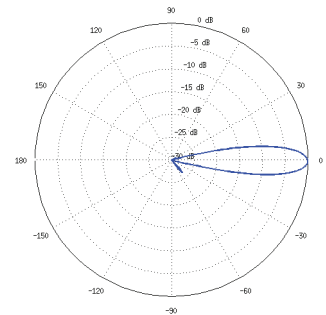
Return Loss



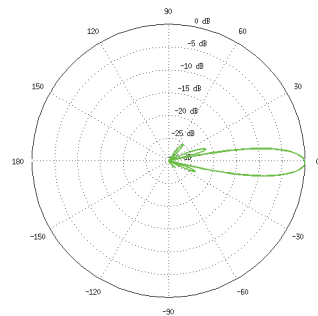
Vertical Azimuth



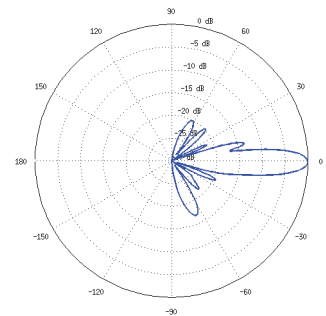
Vertical Elevation



Horizontal Azimuth



Horizontal Elevation



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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