



## Product Overview

*The Juniper AP45 brings the performance and vBLE technology of the Juniper AP43 to the 6GHz band for enterprises needing increased channel widths and capacity. Juniper AI solutions for [Wi-Fi 6E](#) optimize operator and user experiences with secure, near-real-time client-to-cloud automation, insight, and actions.*

# AP45 DATASHEET

## Juniper AI-Driven Network

Juniper brings true innovation to the wireless space with the world's first tri-band AI-driven wireless LAN (WLAN).

The Juniper AI-Driven Enterprise makes Wi-Fi predictable, reliable, and measurable, offering unprecedented visibility into the user experience through the use of unique service-level expectation (SLE) metrics. Proactive, AI-driven automation and self-healing replace time-consuming manual tasks, lowering Wi-Fi operational costs and saving substantial time and money. Juniper also brings enterprise-grade Wi-Fi and Bluetooth Low Energy (LE) together so businesses can increase the value of their wireless networks through personalized location services, such as wayfinding, proximity notifications, and asset location. With Juniper's patented virtual BLE (vBLE) technology, no battery beacons or manual calibration are required. All operations are managed using the open and programmable microservices-based [Juniper Mist™ cloud architecture](#). The system delivers maximum network scalability and performance while also bringing DevOps agility to WLANs and location services.

## The Juniper Mist Cloud Architecture

Our cloud-native, AI-driven microservices architecture delivers unparalleled agility, scale, and resiliency to your network. It lowers OpEx and delivers unprecedented insights into network performance, behaviors, traffic patterns, and potential trouble spots by using data science to analyze large amounts of rich metadata collected by Juniper Access Points.

## Juniper Access Point Family

The Juniper enterprise-grade access point family consists of:

- AP45 Series and AP34, which support Wi-Fi 6E, 802.11ax (Wi-Fi 6), and Bluetooth LE
- AP43, AP12, AP32, AP33, and AP63 Series, which support 802.11ax (Wi-Fi 6) and Bluetooth LE

These access points are all managed by the real-time microservices based in Juniper Mist cloud.

The table below compares the supported major functions of the Juniper Wi-Fi 6E and Wi-Fi 6 access points to help in selecting the most appropriate model(s).

	AP45	AP34	AP43	AP63	AP33	AP32	AP12
<b>Deployment</b>	Indoor	Indoor	Indoor	Outdoor	Indoor	Indoor	Indoor Wall Plate/Desk Mount
<b>Wi-Fi Standard</b>	Wi-Fi 6E 802.11ax (Wi-Fi 6) 4x4 : 4SS	Wi-Fi 6E 802.11ax (Wi-Fi 6) 2x2 : 2SS	802.11ax (Wi-Fi 6) 4x4 : 4SS	802.11ax (Wi-Fi 6) 4x4 : 4SS	802.11ax (Wi-Fi 6) 5GHz: 4x4 : 4SS 2.4GHz: 2x2 : 2SS	802.11ax (Wi-Fi 6) 5GHz: 4x4 : 4SS 2.4GHz: 2x2 : 2SS	802.11ax (Wi-Fi 6) 2x2 : 2SS
<b>Wi-Fi Radios</b>	Dedicated fourth radio	Dedicated fourth radio	Dedicated third radio	Dedicated third radio	Dedicated third radio	Dedicated third radio	Dedicated third radio
<b>Antenna Options</b>	Internal/External	Internal	Internal/External	Internal/External	Internal	Internal/External	Internal
<b>Virtual BLE</b>	✓	–	✓	✓	✓	–	–
<b>IoT Interface</b>	–	–	✓	–	–	–	–
<b>IoT Sensors</b>	Temperature, Accelerometer	Temperature	Humidity, Pressure, Temperature	–	–	–	–
<b>Warranty</b>	Limited Lifetime	Limited Lifetime	Limited Lifetime	One Year	Limited Lifetime	Limited Lifetime	Limited Lifetime
<b>Frequencies Supported</b>	2.4GHz 5GHz 6GHz	2.4GHz 5GHz 6GHz	2.4GHz 5GHz	2.4GHz 5GHz	2.4GHz 5GHz	2.4GHz 5GHz	2.4GHz 5GHz

## Services Available for the Juniper AP45

### Wi-Fi Cloud Services

#### Juniper Mist Wi-Fi Assurance

For IT and NOC Teams

- Predictable and Measurable Wi-Fi
- Service-Level Expectations (SLEs) Support
- WxLAN Policy Fabric for Role-Based Access
- Customizable Guest Wi-Fi Portal
- Radio Resource Management (RRM) Driven by AI

#### Marvis Virtual Assistant

For IT Helpdesk Teams

- AI-Powered Virtual Network Assistant
- Natural Language Processing Interface
- Anomaly Detection
- Client SLE Visibility and Enforcement
- Data Science-Driven Root-Cause Analysis

### Bluetooth Cloud Services

#### Juniper Mist Mobile Engagement

For Digital Experience Teams

- Accurate (1-3m) Turn-by-Turn Navigation
- Sensor Fusion with Dead Reckoning
- Unsupervised Machine Learning
- Virtual Beacons with Custom Notifications
- Mobile SDK for iOS and Android

### Juniper Mist Asset Visibility

For Process and Resource Improvement Teams

- Identification of Assets by Name and Location Visibility
- Zonal/Room Accuracy for Third-Party Tags
- Historical Analytics for Asset Tags
- Telemetry for Asset Tags (temperature, motion, and other data)
- APIs for Viewing Assets and Analytics

### Analytics Cloud Services

#### Juniper Mist Premium Analytics

For Network Teams

- Baseline Analytics Features Come Included with Wi-Fi Assurance, Mobile Engagement, and Asset Visibility Subscriptions
- End-to-End Network Visibility
- Orchestrated Networking and Application Performance Queries
- Simplified Network Transparency
- For Business Teams
- Baseline Analytics Features Come Included with Wi-Fi Assurance, Mobile Engagement, and Asset Visibility Subscriptions
- Customer Segmentation and Reporting Based on Visitor Telemetry
- Customized\* Dwell and Third-Party Reporting for Traffic and Trend Analysis
- Correlation of Customer-Guest Traffic and Trend Analysis
- Correlated Customer-Guest Traffic and Trend Analysis

## Access Point Features

### High Performance Wi-Fi

The AP45 Series is comprised of tri-band, quad-radio 4x4 802.11ax with maximum data rates of 4800 Mbps in the 6GHz band, 2400 Mbps in the 5GHz band, and 1148 Mbps in the 2.4GHz band. The fourth radio functions as a network, location, and security sensor, a synthetic test client radio, as well as a spectrum monitor. With 802.11ax Orthogonal Frequency Division Multiple Access (OFDMA), Multi-User Multiple Input Multiple Output (MU-MIMO), and BSS Coloring technologies, the AP45 Series offers performance at unprecedented levels to support new bandwidth-hungry applications and soaring device densities.

### AI for AX

With the features 802.11ax (Wi-Fi 6E) offers to boost performance and efficiency, configuring and operating an access point has grown far more complex. Juniper automates and optimizes these features with AI for AX capabilities to optimize BSS Coloring, improve data transmission scheduling within OFDMA and MU-MIMO, and assign clients to the best radio to boost the overall performance of the network.

### Greater Spectral Efficiency

OFDMA improves spectral efficiency so that an increasing density of devices can be supported on the network. Density has become an issue with the rapid growth of IoT devices, which often utilize smaller data packets than mobile devices and hence increase the burden and contention on the network. Additionally, BSS Coloring improves the coexistence of overlapping BSSs and allows spatial reuse within a given channel by reducing packet collisions.

### Automatic RF Optimization

With the increasing complexity that the addition of 6GHz spectrum to the 2.4GHz and 5GHz spectrum brings, reliable RF optimization is even more critical than in the past. Radio Resource Management automates dynamic channel and power assignment, taking Wi-Fi and external sources of interference into account with a dedicated sensor radio. The AI engine continuously monitors coverage and capacity SLE metrics to learn and optimize the RF environment. A learning algorithm uses hysteresis on a 24-hour window to conduct a sitewide rebalancing for optimal channel and power assignment.

### Unprecedented Insight and Action

A dedicated, dual-band third radio collects data for Juniper's patent-pending Proactive Analytics and Correlation Engine (PACE),

which uses machine learning to analyze user experiences, correlate problems, and automatically detect their root causes. These metrics are used to monitor SLEs and provide proactive recommendations to ensure problems don't occur (or are fixed as quickly as possible when they do). This radio also functions as a synthetic test client to proactively detect and mitigate network anomalies.

### Improved IoT Battery Efficiency

By incorporating the 802.11ax target wake time (TWT) capability and Bluetooth 5.1, AP45 access points help extend the battery life of IoT devices, particularly as additional ones join the network.

### Dynamic Debugging

Constantly monitor services running on the AP45 and send alerts whenever a service behaves abnormally. Dynamic debugging relieves IT of having to worry about an AP going offline or any services running on it becoming unavailable.

### Dynamic Packet Capture

The Juniper Mist platform automatically captures packets and streams them to the cloud when major issues are detected. This saves IT time and effort and eliminates the need for truck rolls with sniffers to reproduce and capture data for troubleshooting.

### Marvis Virtual Conversational Assistant

[Marvis](#) is a natural language processing (NLP)-based assistant with a Conversational Interface to understand user intent and goals, simplifying troubleshooting and the collection of network insights. It uses AI and data science to proactively identify issues, determine the root causes and scope of impact, and gain insights into your network and user experiences. It eliminates the need to manually hunt through endless dashboards and CLI commands.



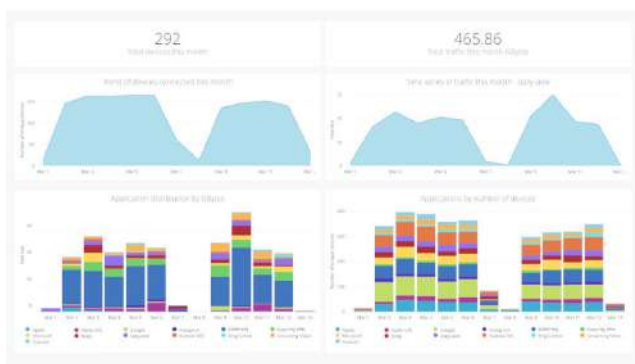
\*Juniper Mist Premium Analytics service subscription is needed

### Effortless, Cloud-Based Setup and Updates

The AP45 automatically connects to the Juniper Mist cloud, downloads its configuration, and joins the appropriate network. Firmware updates are retrieved and installed automatically, ensuring that the network is always up to date with new features, bug fixes, and security updates.

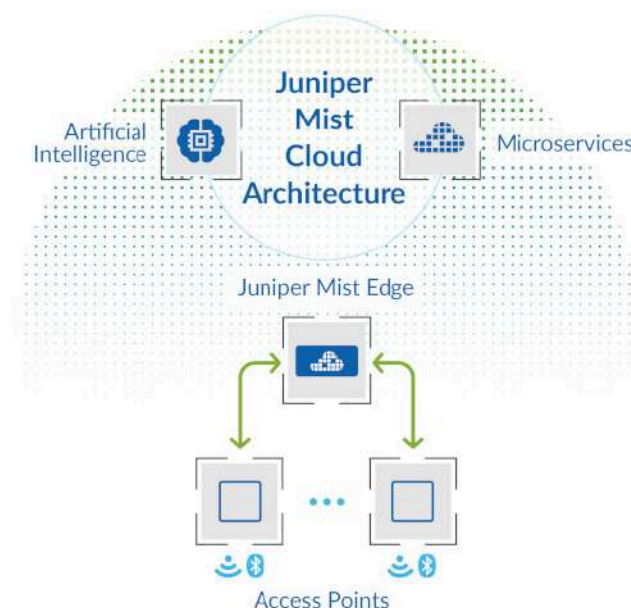
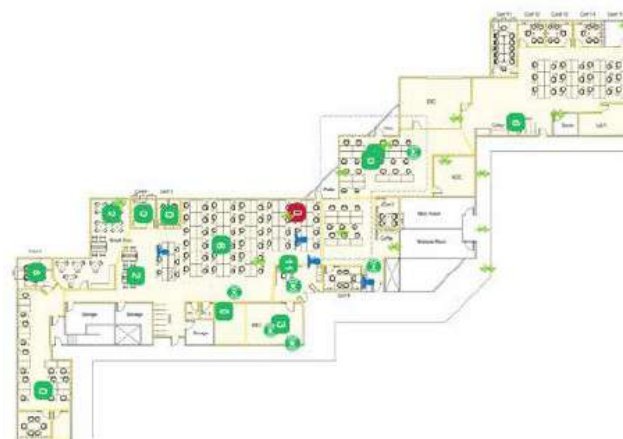
### Premium Analytics

Our [Wireless Assurance](#), [User Engagement](#), and [Asset Visibility](#) services include a base analytics capability for analyzing up to 30 days of data, which enables you to simplify the process of extracting network insights across your enterprise. If you require dynamic insights like motion paths\* and other third-party\* data and would like the option of customized reports, the [Juniper Mist Premium Analytics](#) service is available as an additional subscription.



### High-Accuracy Indoor Location

The AP45 has a 16-element virtual Bluetooth LE (vBLE) antenna array controlled from the Juniper Mist cloud. Passive antennas enhance the power of a single transmitter and produce directional beams (or can be combined to act as an omnidirectional radio) to accurately detect distance and location with 1-3 meter accuracy. With Juniper’s patented vBLE technology, you can deploy an unlimited number of virtual beacons in your physical environment with no need to install battery-powered physical BLE beacons. Support for Bluetooth 5.1 boosts IoT device range and battery life.



### Juniper Mist Edge

Juniper Mist Edge is an on-premises appliance that runs a tunnel termination service. Juniper APs offer a flexible data plane. Traffic can be broken out locally, or tunneled to Juniper Mist Edge. There are many use cases the Juniper Mist Edge solves, including seamless mobility in large campus environments, tunneling of guest traffic to a DMZ, IoT segmentation, and teleworker. Learn more about [Juniper Mist Edge](#).



## Specifications

<b>Wi-Fi Standard</b>	802.11ax (Wi-Fi 6), including support for OFDMA, 1024-QAM, MU-MIMO, Target Wake Time (TWT), Spatial Frequency Reuse (BSS Coloring). Backwards compatibility with 802.11a/b/g/n/ac
<b>Combined Highest Supported Data Rates</b>	Tri-Band: 8.3 Gbps Dual 5GHz (internal antenna model): +6 GHz 9.6Gbps
<b>2.4 GHz</b>	4x4 : 4 802.11ax up to 1,148 Mbps data rate
<b>5 GHz</b>	4x4 : 4 802.11ax up to 2,400 Mbps data rate
<b>6GHz</b>	4x4 : 4 802.11ax up to 4,800 Mbps data rate
<b>MIMO Operation</b>	Four spatial stream SU-MIMO for up to 4,800 Mbps wireless data rate to individual 4x4 HE160 Four spatial stream MU-MIMO for up to 4,800 Mbps wireless data rate to up to four MU-MIMO capable client devices simultaneously
<b>Dedicated Fourth Radio</b>	2.4GHz, 5GHz, and 6GHz tri-band WIDS/WIPS, spectrum analysis, synthetic client and location analytics radio
<b>Internal Antennas (AP45)</b>	Four 2.4GHz omnidirectional antennas with 4 dBi peak gain Four 5GHz omnidirectional antennas with 6 dBi peak gain Four 6GHz omnidirectional antennas with 6 dBi peak gain* *Subject to change
<b>Bluetooth 5.1</b>	vBLE 16-element Directional Antenna Array + Omni Bluetooth Antenna
<b>Beam Forming</b>	Transmit Beamforming and Maximal Ratio Combining
<b>Power Options</b>	<ul style="list-style-type: none"> <li>802.3af: Single radio 1x1 + BLE and Scan. Eth0 1 Gbps, Eth1 disabled, no USB. This mode is meant to connect to the cloud and tell you AP needs more power</li> <li>802.3at: Any two radios 4x4 or with three data radios – 2x2 on 2.4 GHz, 4x4 on 5 GHz, and 2x2 on 6 GHz. BLE and Scan. No PSE out or USB</li> <li>802.3bt: Full function, tri radio 4x4, scan, BLE, eth0, eth1 + PSE out, USB</li> </ul>
<b>Dimensions</b>	230mm x 230mm x 50mm
<b>Shipping Box</b>	289mm x 268mm x 191mm
<b>Weight</b>	AP45 is 2.01kg, AP45E is 1.97kg
<b>Operating Temperature</b>	Internal antenna: 0° to 40° C External antenna: -10° to 50° C
<b>Operating Humidity</b>	10% to 90% maximum relative humidity, non-condensing
<b>Operating Altitude</b>	3,048m (10,000 ft)
<b>Trusted Platform Module (TPM)</b>	Includes a TPM for infrastructure security

## Ordering Information

<b>US/FCC Domain</b>	AP45-US (Internal Antenna) AP45E-US (External Antenna)
<b>Rest of the World</b>	AP45-WW (Internal Antenna) AP45E-WW (External Antenna)

## I/O and Indicators

<b>IoT Sensors</b>	Temperature, Accelerometer
<b>USB</b>	USB 2.0 support interface, 900 mA output
<b>Eth0</b>	100/1000/2500/5000Base-T (802.3bz); RJ45; PoE PD
<b>Eth1</b>	10/100/1000Base-T; RJ45; optional PoE 15.4W PSE mode (requires 802.3bt on Eth0)
<b>External Antennas (AP45E)</b>	Two pluggable antenna connectors; 2.4/5 (4 pin), 6+Scan (6 pin)
<b>Reset</b>	Reset to the factory default settings
<b>Indicators</b>	One multicolor status LED
<b>Traffic Forwarding Options</b>	Eth0, Eth1, Juniper Mist Edge

## Mounting Brackets

<b>APBR-U*</b>	Universal bracket
<b>APBR-ADP-M16</b>	16mm threaded rod (M16-2)
<b>APBR-ADP-T58</b>	3/8" Threaded Rod
<b>APBR-ADP-CR9</b>	9/16" T-Rail, Channel Rail
<b>APBR-ADP-RT15</b>	15/16" T-Rail
<b>APBR-ADP-WS15</b>	1-1/2" T-Rail
<b>APBR-ADP-T12</b>	1/2" threaded rod

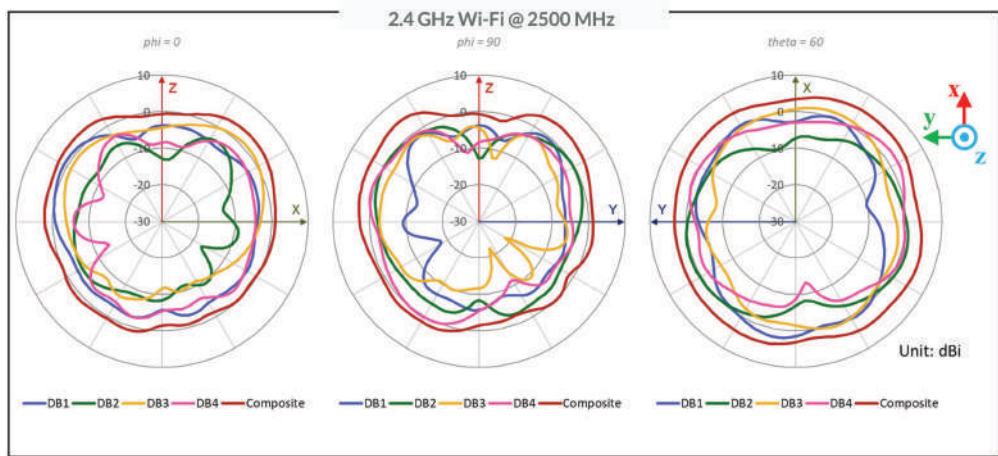
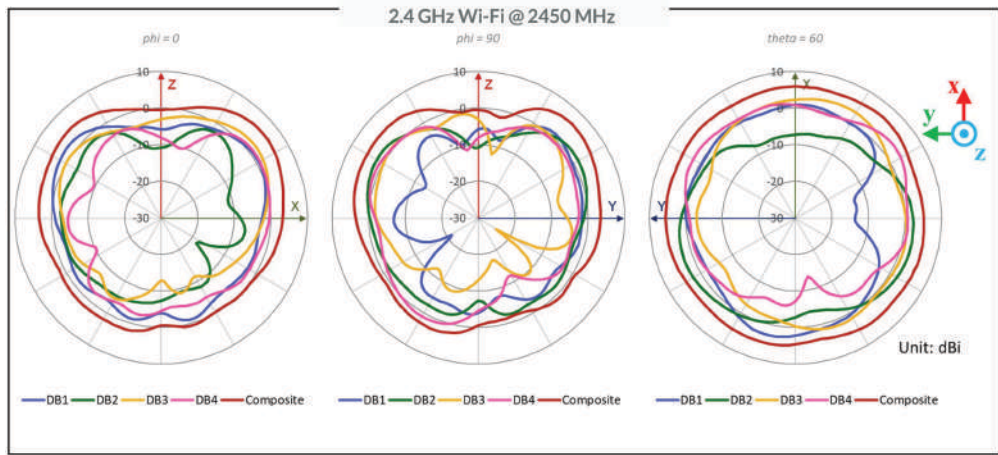
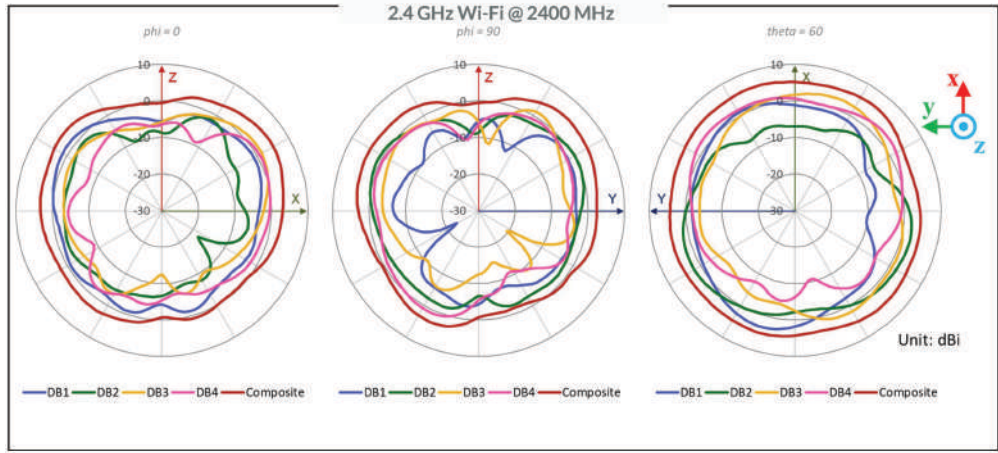
\*The AP package includes one Universal Bracket. APBR-U is available separately as an accessory.

## Patented vBLE Technology

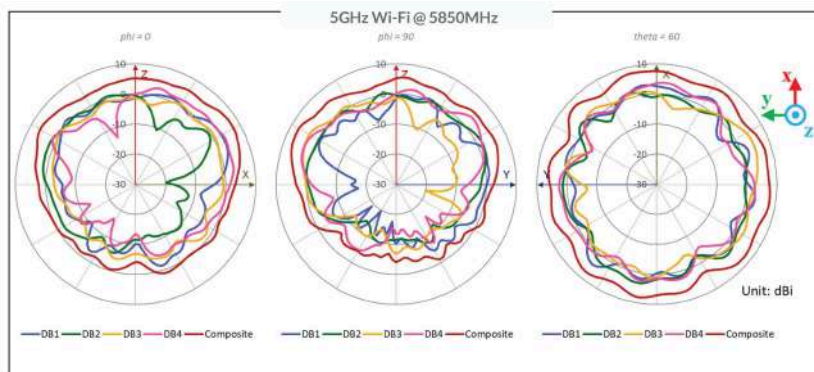
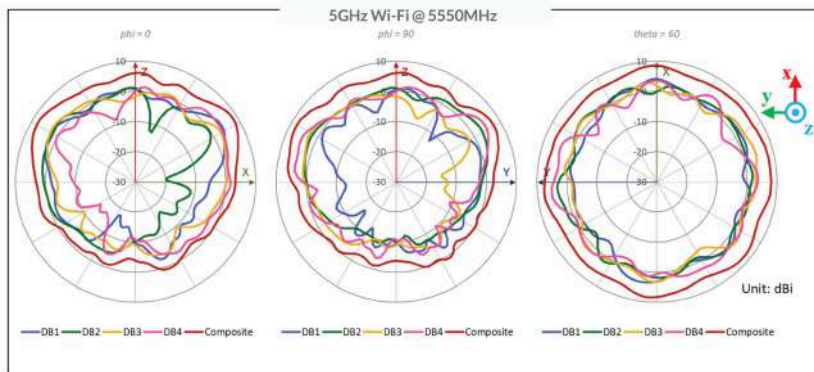
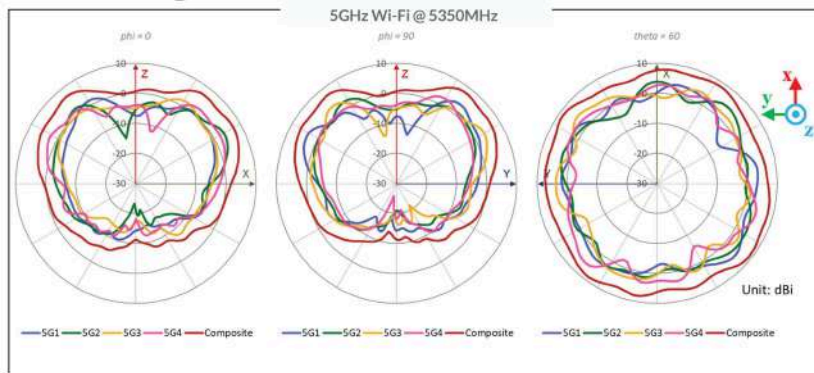
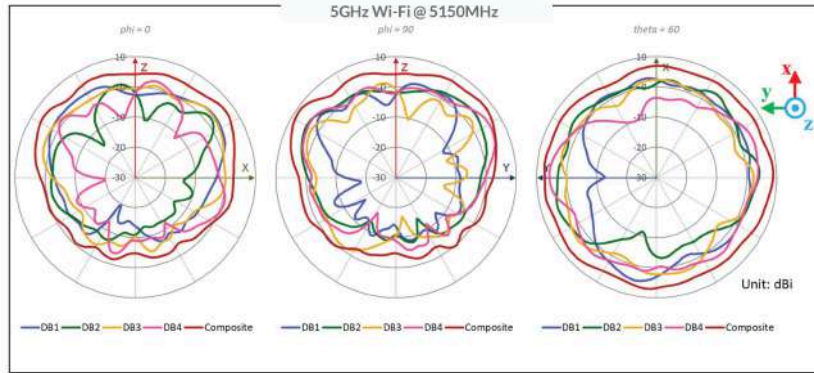
In addition to the industry-leading Wi-Fi technology at the heart of the AP45 access point, our second-generation, patented, and dynamic, 16-element virtual Bluetooth LE (vBLE) antenna array combines with machine learning to eliminate the need for battery-powered beacons. This maximizes scalability and optimizes your deployment investment in location-based services.

vBLE enables businesses to provide rich location-based experiences that are engaging, accurate, real-time, and scalable.

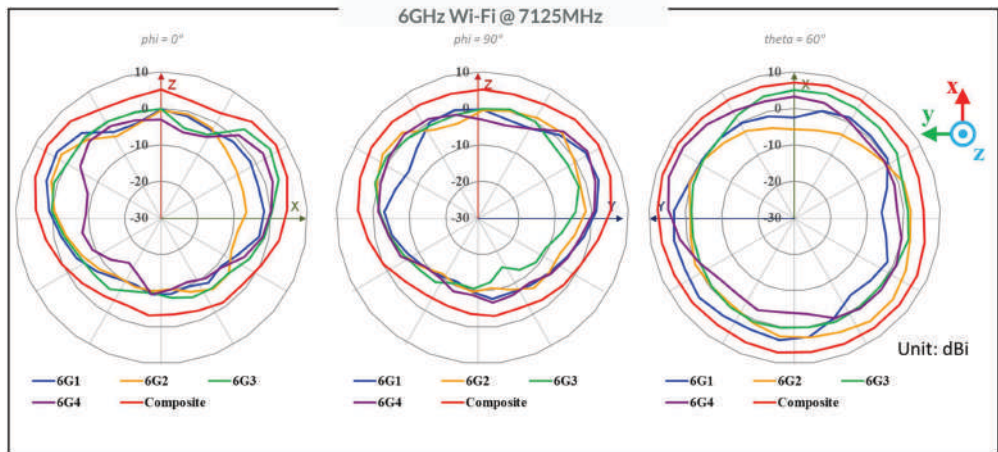
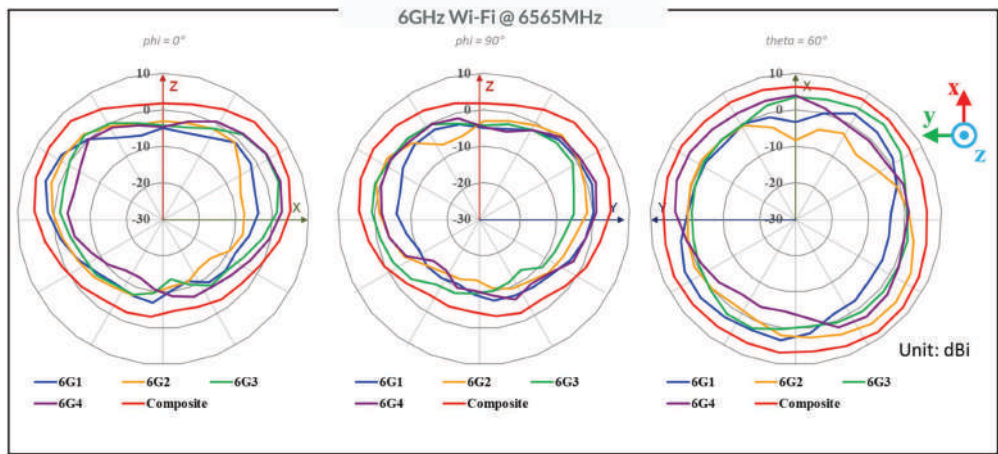
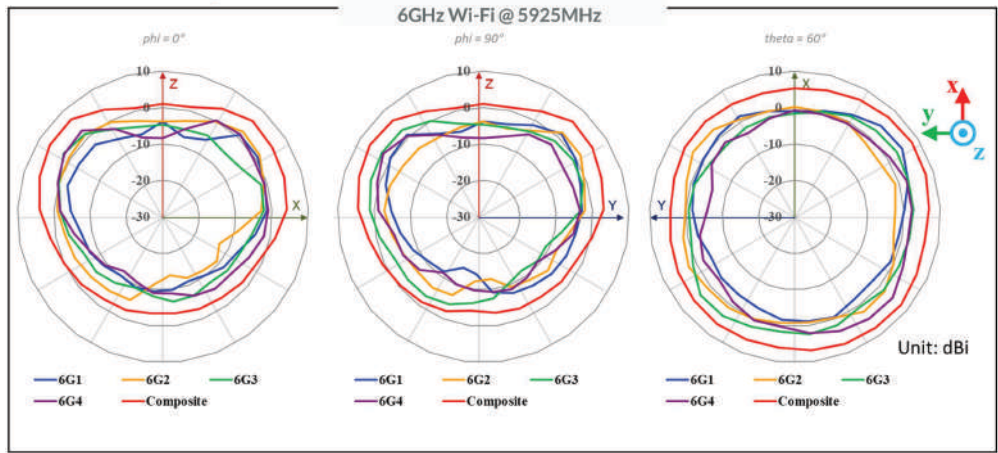
### AP45 Dual Band Radio 2.4GHz Wi-Fi Antenna Plots



### AP45 Dual Band Radio 5GHz Wi-Fi Antenna Plots

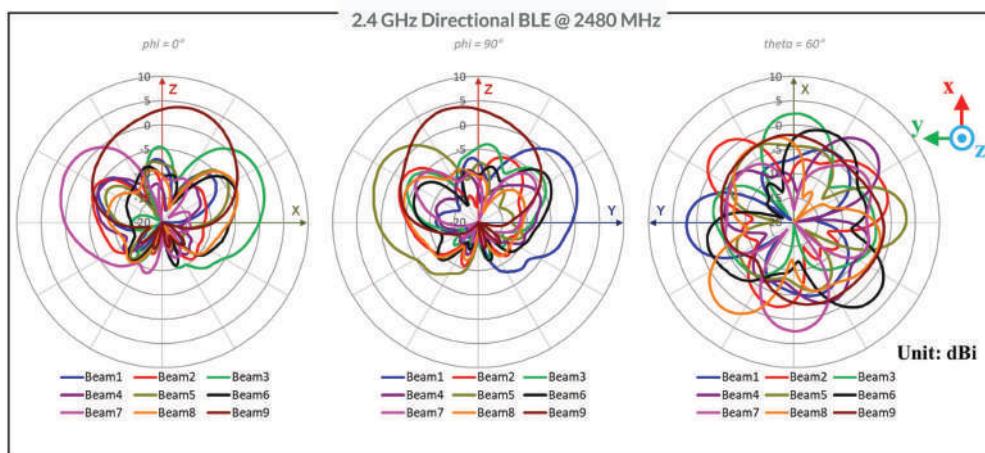
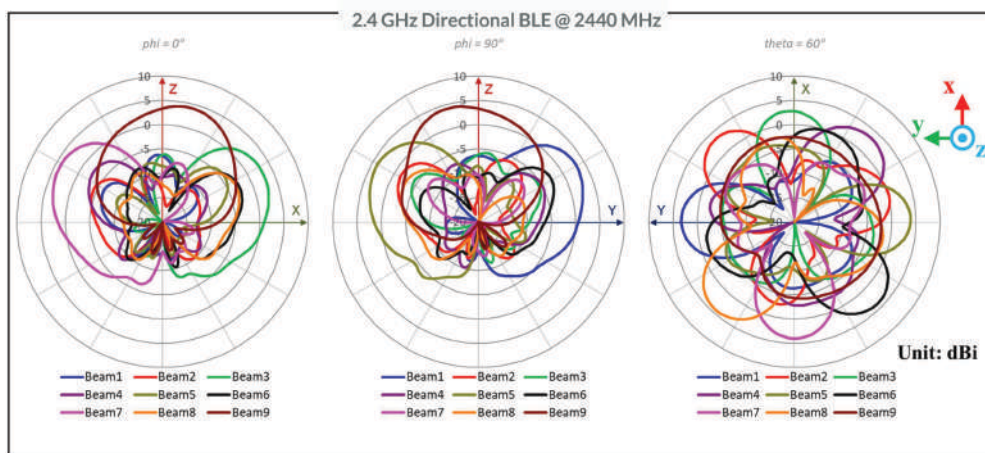
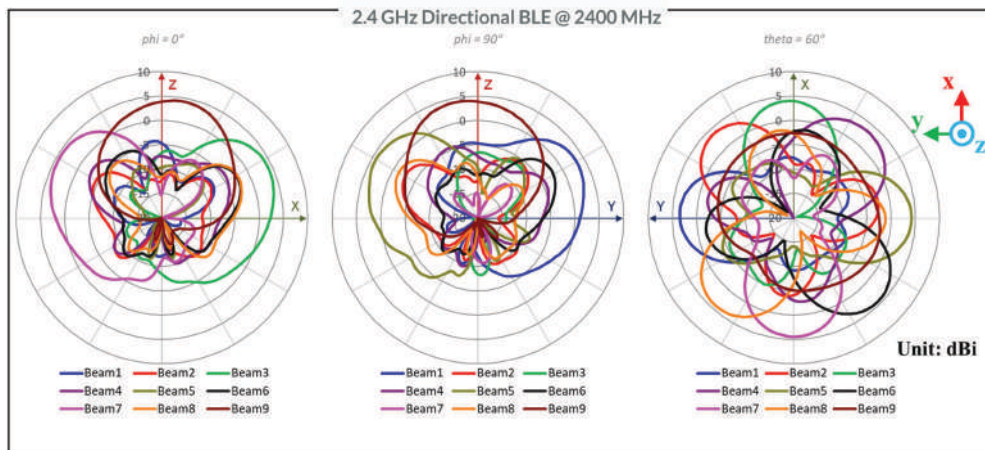


AP45 6GHz Wi-Fi Antenna Plots

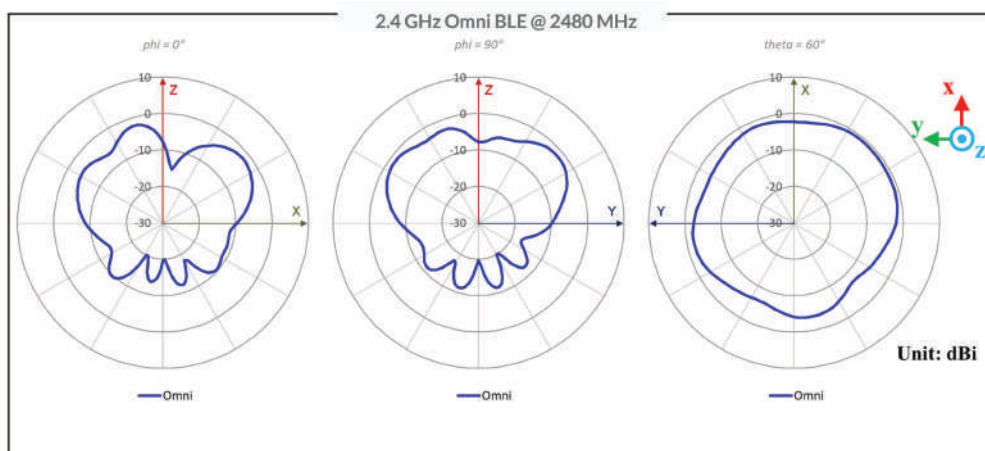
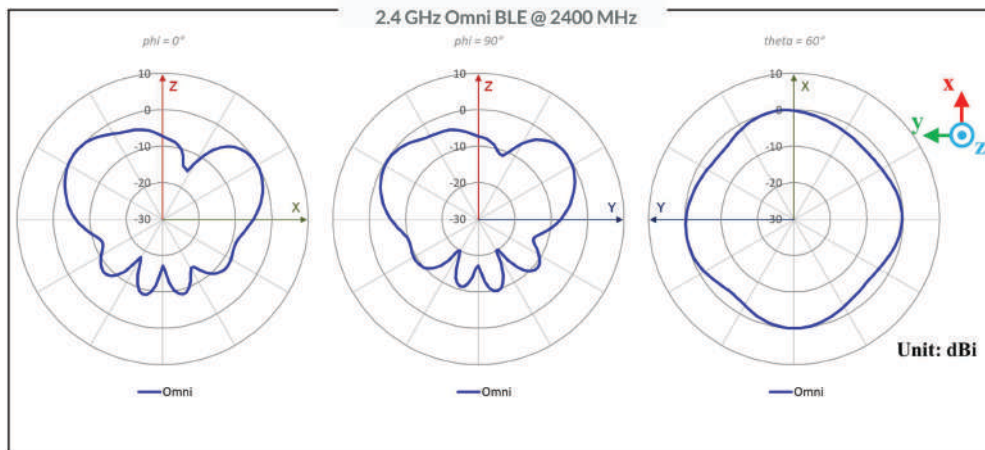




### AP45 2.4GHz Directional BLE Antenna Plots



### AP45 2.4GHz Omni BLE Antenna Plots



## About Juniper Networks

At Juniper Networks, we are dedicated to dramatically simplifying network operations and driving superior experiences for end users. Our solutions deliver industry-leading insight, automation, security and AI to drive real business results. We believe that powering connections will bring us closer together while empowering us all to solve the world's greatest challenges of well-being, sustainability and equality.

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