driven by Mist AI

AP33 ACCESS POINT

Mist AI™-Driven 802.11ax APs Automate Network Operations

The AP33 access point and dynamic virtual Bluetooth® LE (vBLE) antenna array automate network operations and boost Wi-Fi performance, while providing dynamic network insights and location services. Through its vBLE technology and open APIs, the AP33 enables the delivery of location-based services with one- to three-meter accuracy. It offers an aggregate data rate up to 3Gbps with the 2.4GHz and 5GHz bands running concurrently. Managed by the Juniper Mist™ Cloud Architecture, it delivers unprecedented user experiences at a lower cost for retail, warehouse, school, clinic, and home office environments.

JUNIPER AI-DRIVEN NETWORK
Juniper Mist brings true innovation to the wireless space with the world's first AI-driven wireless LAN (WLAN).

The Juniper AI-Driven Enterprise makes Wi-Fi predictable, reliable, and measurable with unprecedented visibility into the user experience through customizable service-level expectation (SLE) metrics. Time-consuming manual IT tasks are replaced by AI-driven proactive automation and self-healing, lowering Wi-Fi operational costs and saving substantial time and money.

All operations are managed via our open and programmable microservices architecture, which delivers maximum scalability and performance while also bringing DevOps agility to wireless networking and location services.

### THE JUNIPER MIST CLOUD ARCHITECTURE
Mist AI leverages a cloud-native microservices architecture to bring unparalleled agility, scale, and resiliency to your network. Our AI engine helps lower OpEx and deliver unprecedented insight by using data science to analyze large amounts of rich metadata collected from Juniper Access Points.

JUNIPER ACCESS POINT FAMILY
The Mist enterprise-grade access point family consists of:
- AP33, AP12, AP32, AP43, and AP63 Series, which support 802.11ax (Wi-Fi 6), Bluetooth LE, and IoT
- AP21, AP41, and AP61 Series, which support 802.11ac Wave 2, Bluetooth LE, and IoT
- BT11, which supports Bluetooth LE

These access points are all built on a real-time microservices platform and are managed by the Juniper Mist cloud.

AP33   AP33 (rear)
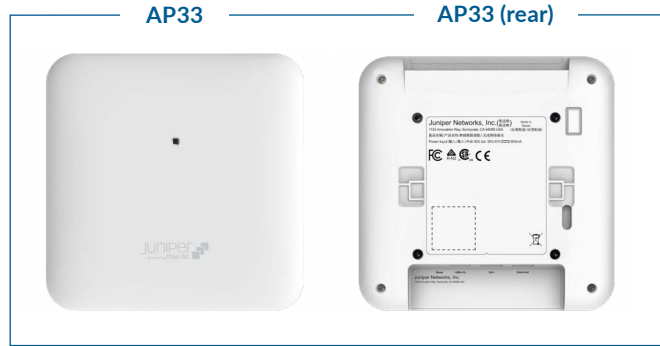
The table below compares the supported major functions of the Juniper Wi-Fi 6 access points to help in selecting the model(s).

	AP43	AP63	AP33	AP32	AP12
Deployment	Indoor	Outdoor	Indoor	Indoor	Indoor Wall Plate
Wi-Fi Standard	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
Wi-Fi Tri-Radio	✓	✓	✓	✓	✓
Antenna Options	Internal/ External	Internal/ External	Internal	Internal/ External	Internal
Virtual BLE	✓	✓	✓	—	—
IoT Interface	✓	—	—	—	—
IoT Sensors	Humidity, Pressure, Temperature	—	—	—	—
Warranty	Limited Lifetime	One Year	Limited Lifetime	Limited Lifetime	Limited Lifetime

SERVICES AVAILABLE FOR THE JUNIPER AP33

WI-FI CLOUD SERVICES

Juniper Mist Wi-Fi Assurance

For IT and NOC Teams
- Predictable and Measurable Wi-Fi
- Service-Level Expectation (SLE) Support
- WxLAN Policy Fabric for Role-Based Access
- Customizable Guest Wi-Fi Portal
- Radio Resource Management (RRM)

Marvis Virtual Assistant

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

BLUETOOTH LE 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 View Location
- 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
- Correlated Customer-Guest Traffic and Trend Analysis

*Juniper Mist Premium Analytics service subscription is needed

ACCESS POINT FEATURES

High-Performance Wi-Fi

The AP33 is a six-stream access point. It supports 4x4:4SS in the 5GHz band, delivering a maximum data rate of 2,400 Mbps for high-bandwidth applications. It also supports 2x2:2SS in the 2.4GHz band, delivering a maximum data rate of 575 Mbps. The integrated third radio functions as a network, location, and security sensor, a synthetic test client radio, as well as a spectrum monitor.

AI for AX

With the new features that 802.11ax (Wi-Fi 6) introduces to boost performance and efficiency, configuring and operating an access point has grown far more complex. Juniper automates and optimizes these features with our AI for AX capabilities to 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 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

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. The 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 experience, correlate problems, and automatically detect their root cause. 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 5.0, AP33 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 AP33 Series 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 Network 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.
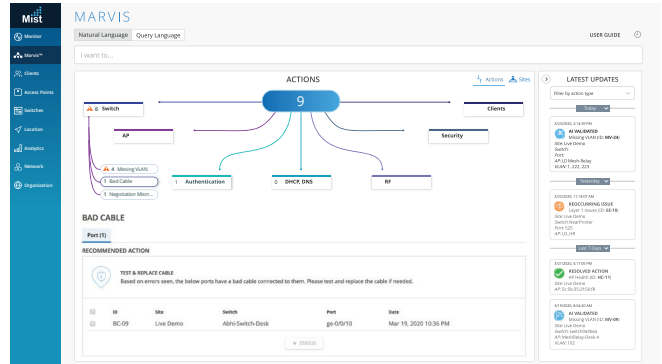

Effortless, Cloud-Based Setup and Updates

The AP33 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.

Analytics

Juniper Mist Wi-Fi Assurance, User Engagement and Asset Tracking 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.
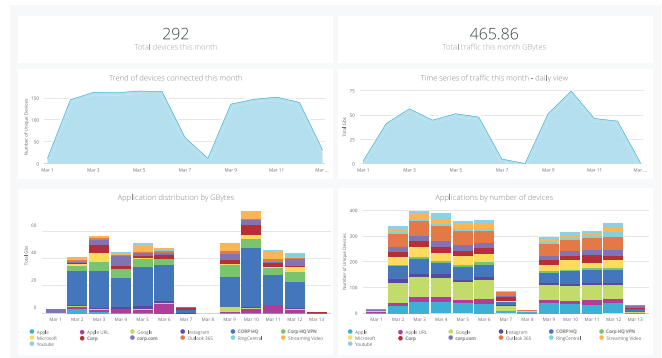
High-Accuracy Indoor Location

The AP33 has a 16-element 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 one- to three-meter accuracy. With Juniper's patented vBLE technology, you can deploy an unlimited number of virtual beacons in your physical environment with no battery-powered BLE beacons required. With support for Bluetooth 5.0, the access point boosts IoT device signal range and battery life.

*Juniper Mist Premium Analytics service subscription is needed

SPECIFICATIONS

Wi-Fi Standard	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
Combined Highest Supported Data Rates	3.0 Gbps
2.4GHz	2x2 : 2 802.11b/g/n/ac up to 400 Mbps data rate; 2x2 : 2 802.11ax up to 575 Mbps data rate
5GHz	4x4 : 4 802.11ax up to 2,400 Mbps data rate
MIMO Operation	Four spatial stream SU-MIMO for up to 2,400 Mbps wireless data rate to individual 4x4 HE80 Four spatial stream MU-MIMO for up to 2,400 Mbps wireless data rate to up to four MU-MIMO-capable client devices simultaneously
Dedicated Third Radio	2.4GHz and 5GHz dual-band WIDS/WIPS, spectrum analysis, synthetic client and location analytics radio
Internal Antennas	Two 2.4GHz omnidirectional antennas with 5 dBi peak gain Four 5GHz omnidirectional antennas with 6 dBi peak gain
Bluetooth 5.0	vBLE 16-element directional antenna array + omnidirecctional Bluetooth antenna
Beam Forming	Transmit Beamforming and Maximal Ratio Combining
Power Options	802.3at PoE, 802.3bt PoE
Dimensions	202 x 202 x 44 mm (7.95 x 7.95 x 1.73 in)
Weight	0.98 kg (2.16 lbs) excluding mount and accessories
Operating Temperature	Internal antenna: 0° to 40° C
Operating Humidity	10% to 90% maximum relative humidity, non-condensing
Operating Altitude	3,048 m (10,000 ft)

I/O AND INDICATORS

USB	USB 2.0 support interface
Eth0	100/1000Base-T, 2.5GBase-T (802.3bz); RJ45; PoE PD
Eth1	10/100/1000Base-T; RJ45
Reset	Reset to the factory default settings
Indicators	One multicolor status LED

MOUNTING BRACKETS

APBR-U*	Universal bracket
APBR-T58	⅜" threaded rod
APBR-M16	16mm threaded rod (M16-2)
APBR-ADP-CR9	⁹⁄₁₆" T-Rail
APBR-ADP-RT15	¹⁵⁄₁₆" T-Rail
APBR-ADP-WS15	1½" T-Rail
APBR-ADP-T12	½" threaded rod

*The AP package includes one universal bracket. APBR-U is available separately as an accessory.
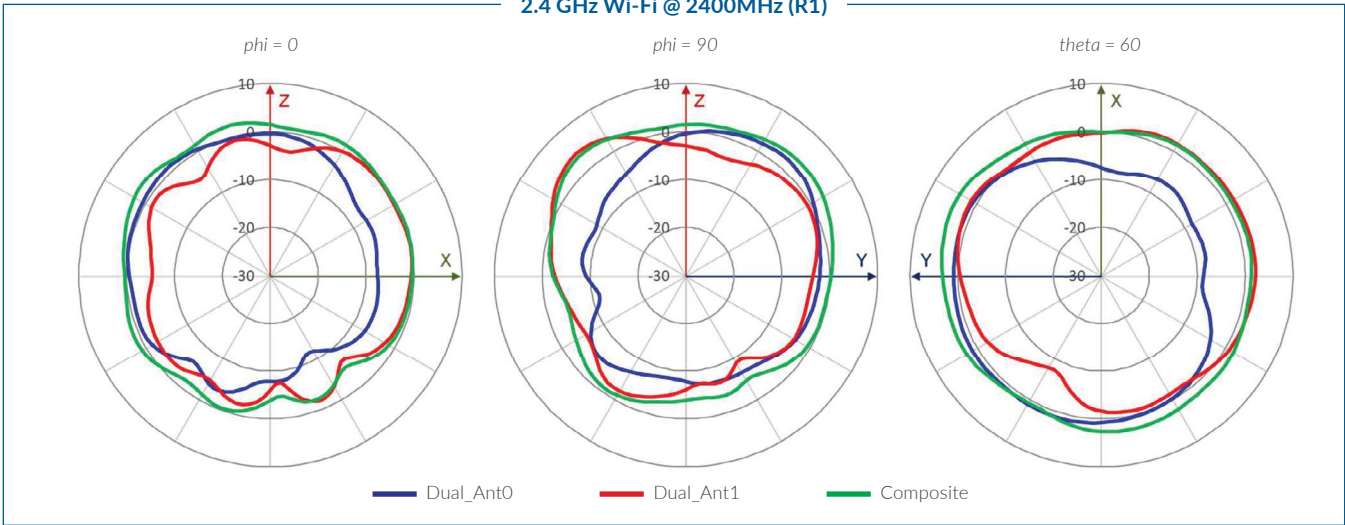
BLUETOOTH ANTENNA ARRAY

PATENTED VBLE TECHNOLOGY

In addition to the industry-leading Wi-Fi technology at the heart of the AP33 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.
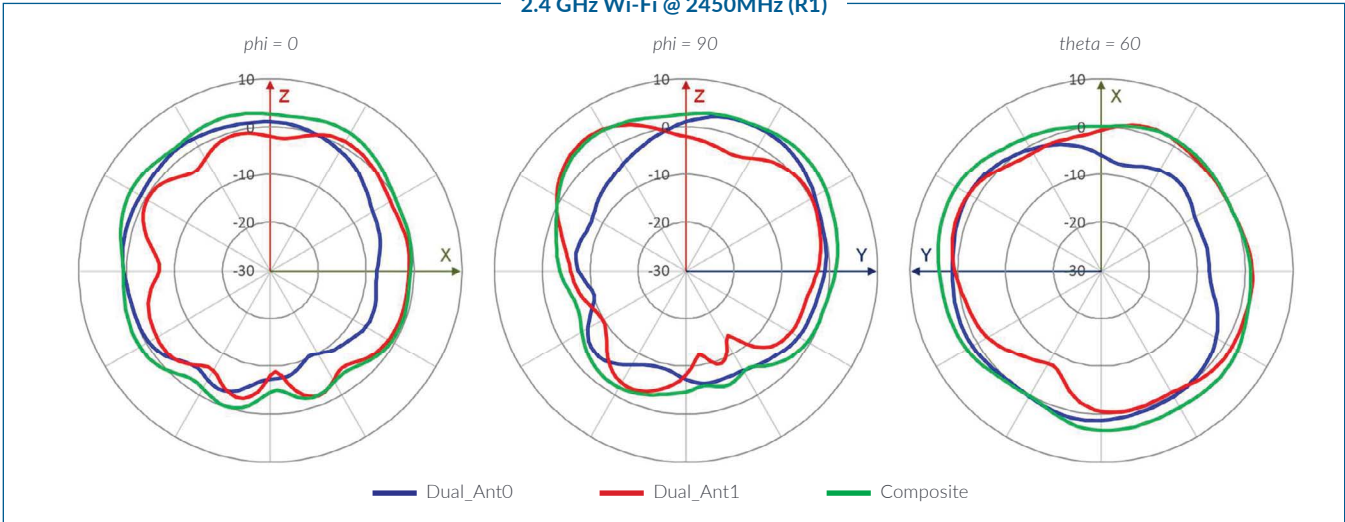
vBLE enables businesses to provide rich location-based experiences that are engaging, accurate, real-time, and scalable.
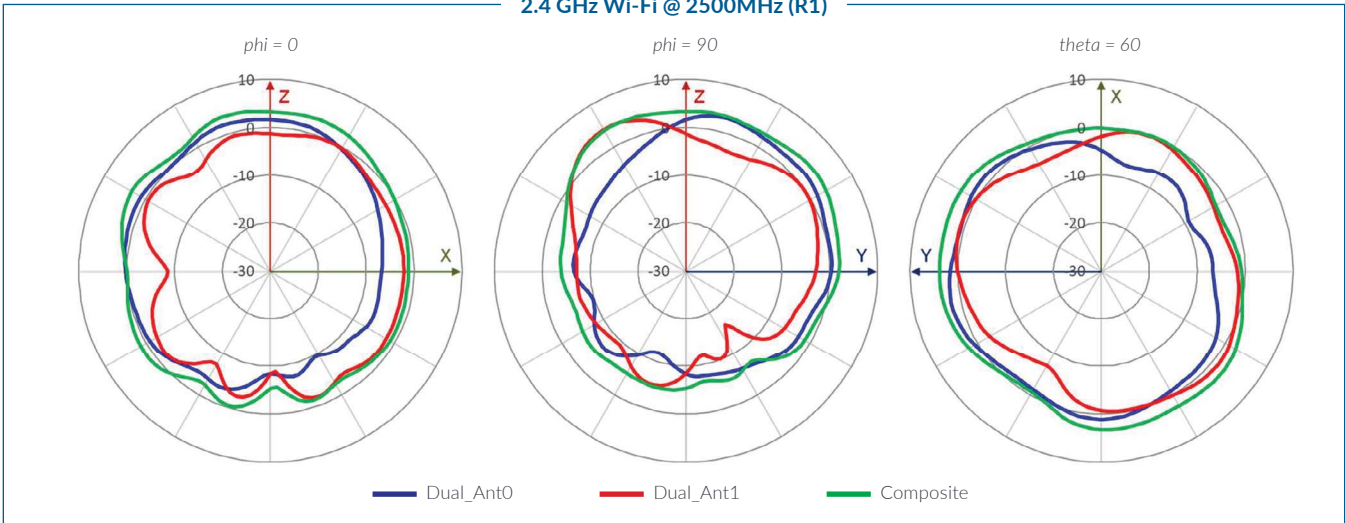
AP33 2.4GHZ WI-FI ANTENNA PLOTS
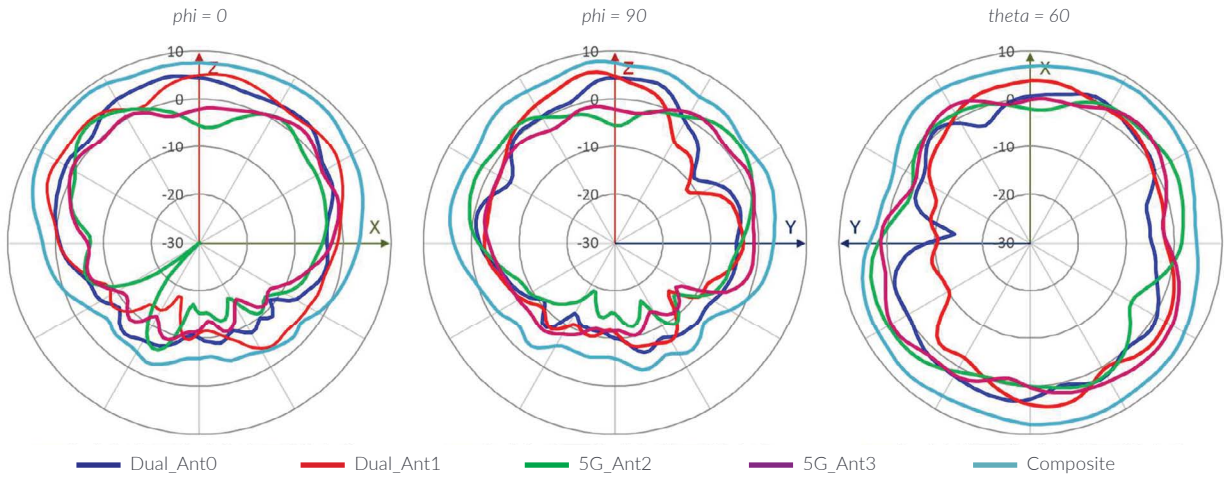
2.4 GHz Wi-Fi @ 2400MHz (R1)

phi = 0 *phi = 90* *theta = 60*

— Dual_Ant0 — Dual_Ant1 — Composite

2.4 GHz Wi-Fi @ 2450MHz (R1)

phi = 0 *phi = 90* *theta = 60*

— Dual_Ant0 — Dual_Ant1 — Composite

2.4 GHz Wi-Fi @ 2500MHz (R1)

phi = 0 *phi = 90* *theta = 60*

— Dual_Ant0 — Dual_Ant1 — Composite

AP33 WI-FI ANTENNA PLOTS

5 GHz Wi-Fi @ 5150MHz (R0)

phi = 0

phi = 90

theta = 60

Dual_Ant0   Dual_Ant1   5G_Ant2   5G_Ant3   Composite

5 GHz Wi-Fi @ 5550MHz (R0)

phi = 0

phi = 90

theta = 60

Dual_Ant0   Dual_Ant1   5G_Ant2   5G_Ant3   Composite

5 GHz Wi-Fi @ 5850MHz (R0)

phi = 0

phi = 90

theta = 60

Dual_Ant0   Dual_Ant1   5G_Ant2   5G_Ant3   Composite
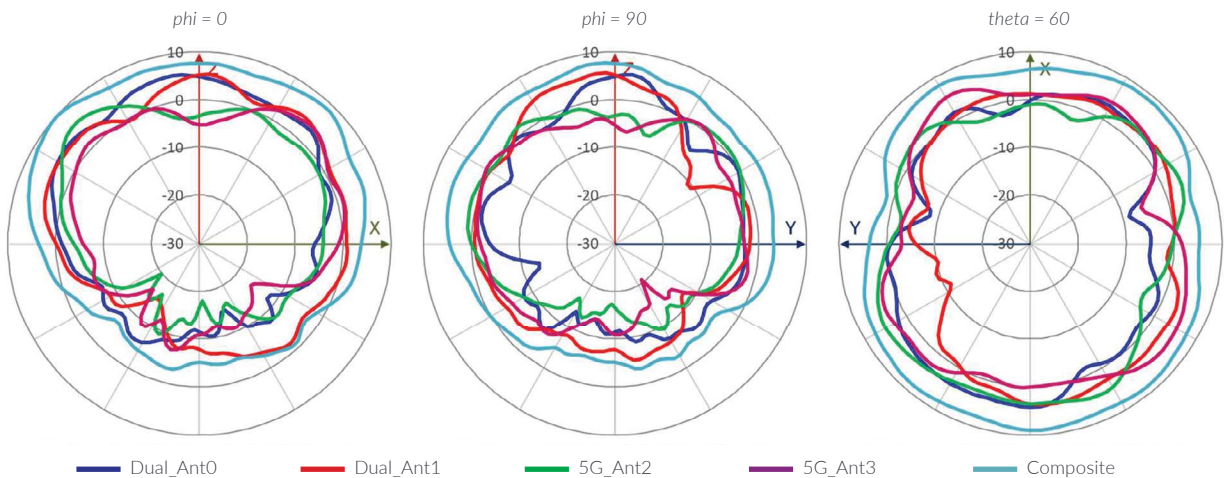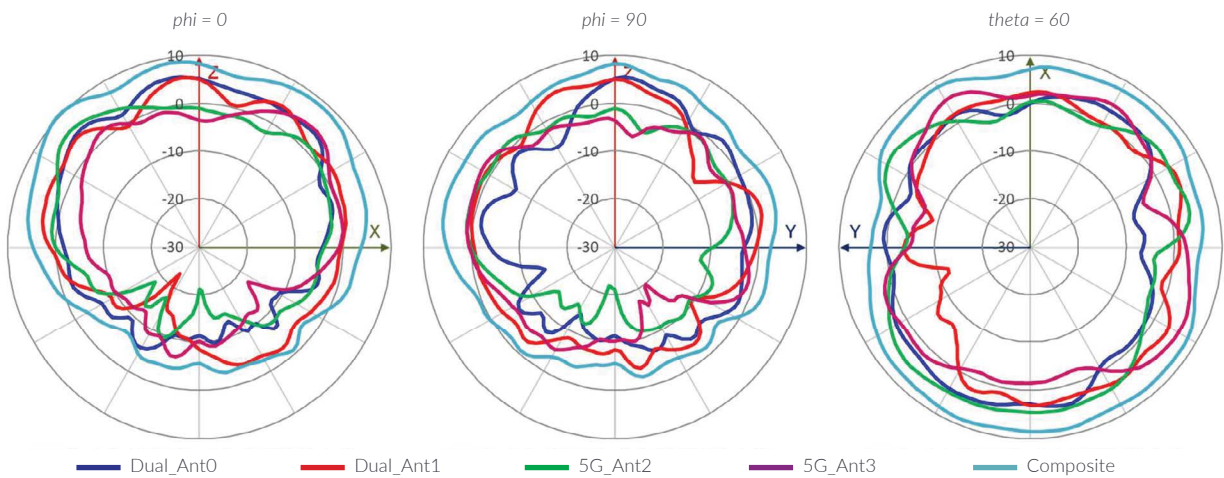
AP33 DIRECTIONAL BLE ANTENNA PLOTS

2.4GHz Directional BLE @ 2400MHz

phi = 0

phi = 90

theta = 60

Beam 1 — Beam 2 — Beam 3 — Beam 4 — Beam 5 — Beam 6 — Beam 7 — Beam 8 — Beam 9

2.4GHz Directional BLE @ 2440MHz

phi = 0

phi = 90

theta = 60

Beam 1 — Beam 2 — Beam 3 — Beam 4 — Beam 5 — Beam 6 — Beam 7 — Beam 8 — Beam 9

2.4GHz Directional BLE @ 2480MHz

phi = 0

phi = 90

theta = 60

Beam 1 — Beam 2 — Beam 3 — Beam 4 — Beam 5 — Beam 6 — Beam 7 — Beam 8 — Beam 9
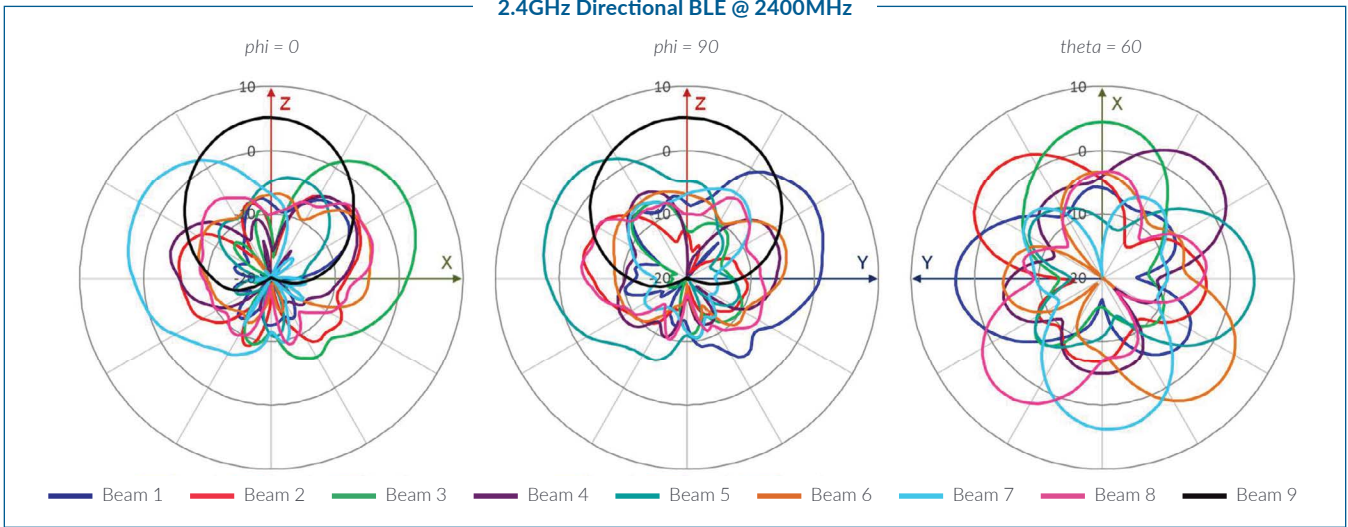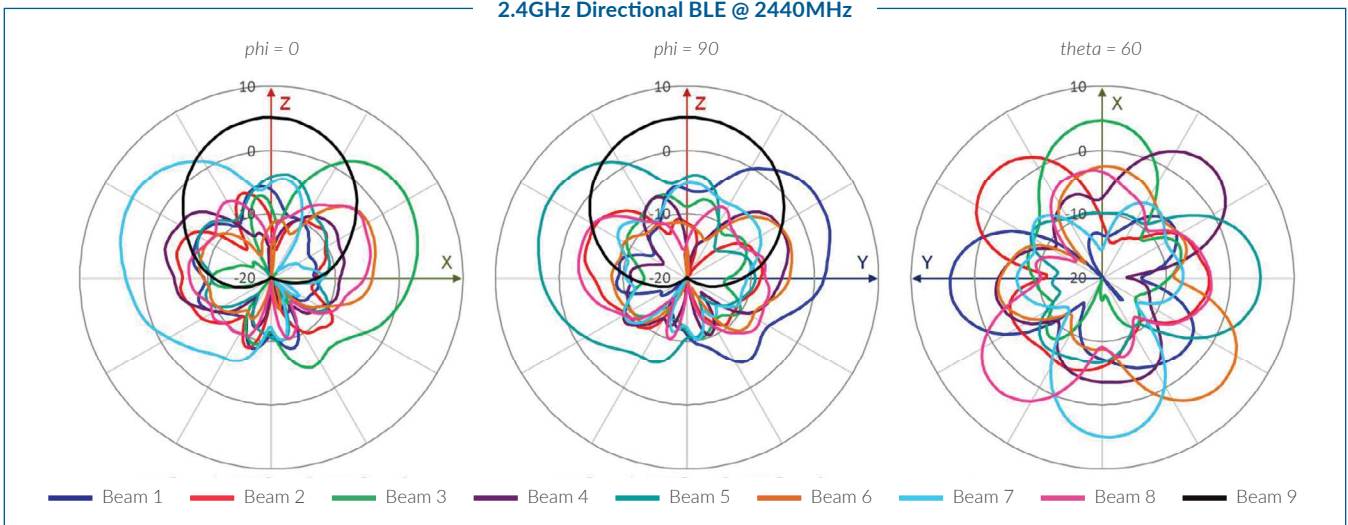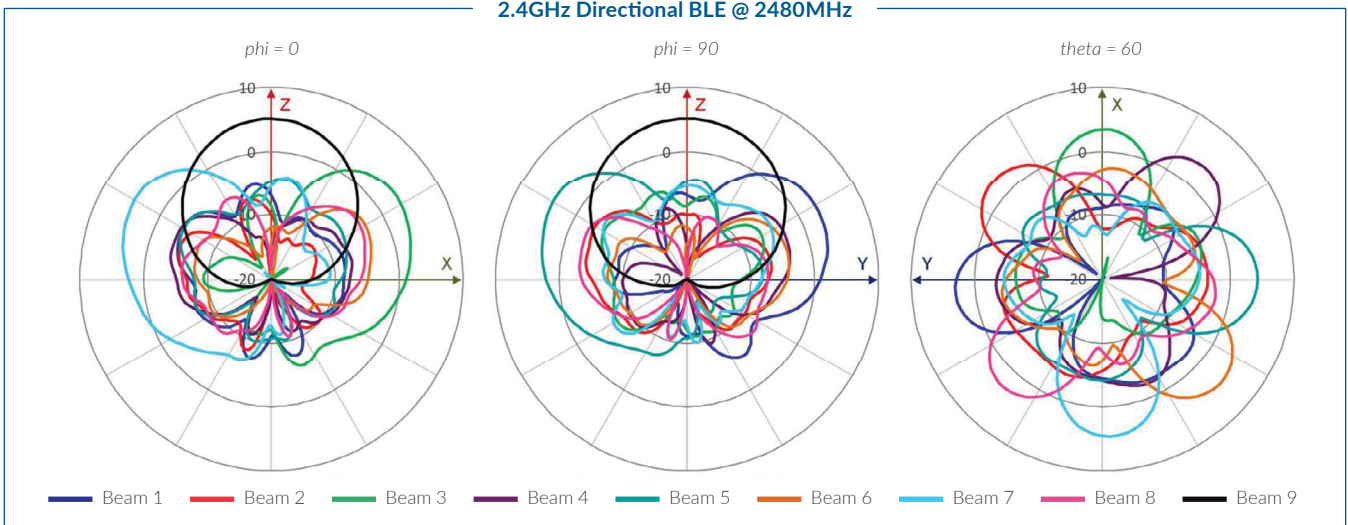
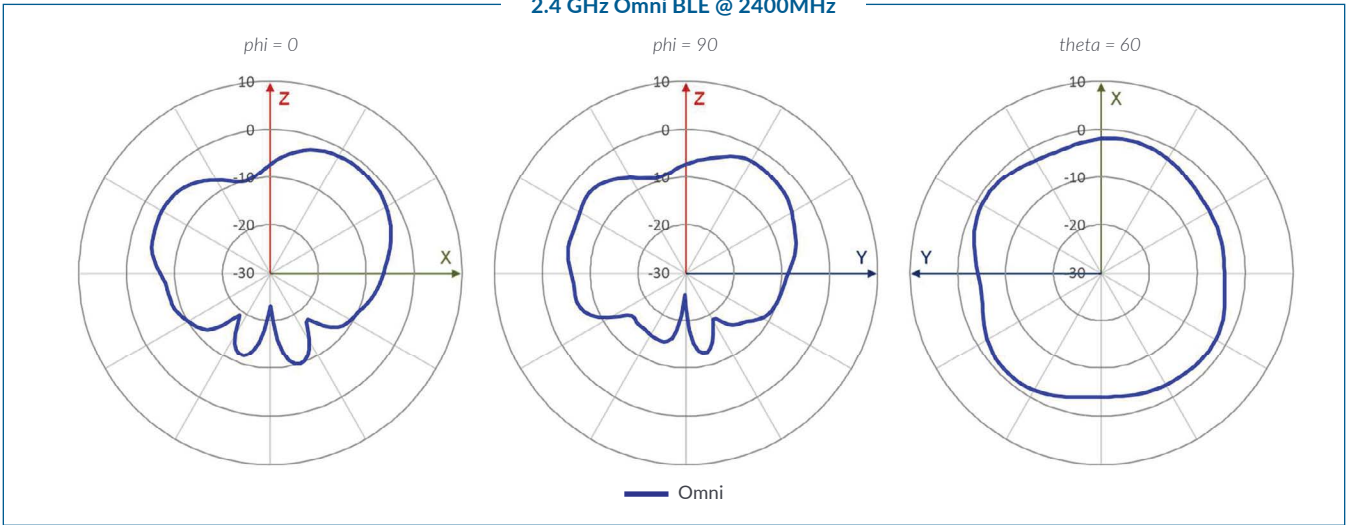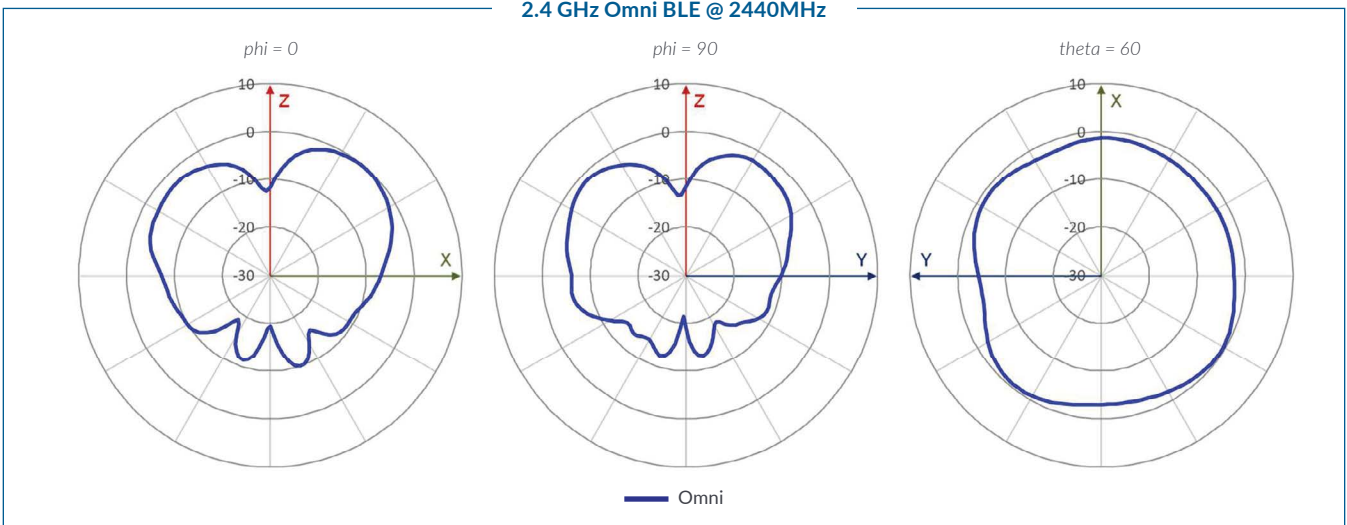## AP33 OMNI BLE ANTENNA PLOTS

2.4 GHz Omni BLE @ 2400MHz

2.4 GHz Omni BLE @ 2440MHz

2.4 GHz Omni BLE @ 2480MHz