# AP460i/e

## Highlights

Advanced Radio Technology
Tri-Radio Design
- 5 GHz 4x4:4
- 2.4 GHz 2x2:2
- Sensor 2x2:2 (2.4 GHz/5 GHz)

High Density Environments
- Delivers exceptional end-user experience even in the densest user environments

WPA3 Support
- Includes the latest WPA3 Wi-Fi security standard delivering robust protections for users and IoT devices

Fully Functional over 802.3af
- Capable of operation over 802.3af

Cellular Coexistence Filter (CCF)
- Minimizes the impact of interference from cellular networks

Designed for Harsh Environments
- IP67 Outdoor Rated
- Extended temp range -40°C to +60°C

Smart Management Choices
- ExtremeCloud™ Controller or VX/NX controllers ideal for on-premises requirements
- Optional ExtremeCloud IQ visibility supported via on-premises controller


## Wi-Fi 6 (802.11ax) Tri-Radio Outdoor Access Point with integrated or external antenna options

The AP460i/e is designed for harsh environments; from hurricane force winds to sub-zero temperature. The AP460i/e is IP67 outdoor rated and extends Extreme's Wi-Fi 6 coverage outdoors in a sleek form factor that is easy to install. Integrated GPS and BLE allows for state of the art location applications for asset tracking.

The AP460i/e provides high-efficiency, high-performance 802.11ax aggregate datarates up to 4.8 Gbps in the 5 GHz band and concurrent 2.4 Gbps in the 2.4 GHz band. Designed for high density environments, AP460i/e is powerful enough and smart enough to provide the highest level of client services without compromising security monitoring. Unlike other access points that scan only part time, the dedicated, dual-band sensor scans for rogue devices full time, eliminating the risk of vulnerability or attacks.

With more users, more devices, more things, more applications and more threats straining the infrastructure, the AP460i/e was engineered to meet those challenges. The AP460i/e combines powerful 802.11ax Wi-Fi 6 technology, advanced security and ML/AI management capabilities together into an enterprise class solution that allows you to deploy high speed, highly secure Wi-Fi into the toughest environments.

## Security

The AP460i/e delivers the highest level of security services, beginning with support for the latest Wi-Fi Alliance WPA3 security certifications. Additionally, supporting a stateful L2-L7 DPI firewall for context-based access security.

## Wi-Fi 6 (802.11ax) Technology

Prior generations of 802.11n, 802.11ac wave 1 and 2, can be considered generational improvements with an emphasis on faster speed. 802.11ax technology instead enhances Wi-Fi efficiency as well as speed, taking Wi-Fi networks to an entirely new level. To learn more about 802.11ax, go to https://www.extremenetworks.com/are-you-ready-for-802-11ax/.

## Smart Sensor

Industry's first Dual-radio 802.11ax access point with Smart Sensor capability to optimally manage radios to provide the highest level of client performance while simultaneously providing continuous RF monitoring for security threats.

The AP460i/e patent pending Smart-Sensor feature automates the provisioning of ADSP Sensors in customer setup without compromising their security performance. This feature intelligently selects and configures the radio on APs that must act as sensors to cover entire site from wireless security perspective reducing the burden of network engineers.

## Management Analytics

In conjunction with management system, cloud or on-premises, the AP460i/e provides a very rich set of data displayed via context driven widgets, representing historical data or a combination of historical and current data. This provides context-specific granularity with perspective views for locations, network, APs, individual client devices, and policy roles. In each context, administrators can adjust dashboards from widget library.

## RF Monitoring

Network managers will appreciate a powerful choice of RF management for their Wi-Fi networks, with SmartRF, a robust RF management system with AI/ML like functionality. Built on 10 years of experience across thousands of large scale networks and millions of access points, SmartRF algorithms manage channels, radios, load balancing, band steering, and many other attributes of the RF.

## Integrated BLE

To support both IoT and Guest Engagement services, the AP460i/e integrates Bluetooth to connect with IoT devices with Thread wireless or engage loyalty customers with Apple iBeacon. Enterprises can use Google Eddystone to send advertisements directly to shoppers, guests, and conference attendees. This makes it ideal for businesses to advertise their app-download pages, captive portals, or site- specific information.

# Product Specifications

## Radio Specifications

Max Users

SSID per Radio/Total: 8/16

Users per Radio/total: 512/1024

802.11a

5.150–5.850 GHz Operating Frequency

Orthogonal Frequency Division Multiplexing (OFDM) Modulation

Rates (Mbps): 54, 48, 36, 24, 18, 12, 9, 6 w/auto fallback

802.11b

2.4–2.5 GHz Operating Frequency

Direct-Sequence Spread-Spectrum (DSSS) Modulation

Rates (Mbps): 11, 5.5, 2, 1 w/auto fallback

802.11g

2.4–2.5 GHz Operating Frequency

Orthogonal Frequency Division Multiplexing (OFDM) Modulation

Rates (Mbps): 54, 48, 36, 24, 18, 12, 9, 6 w/auto fallback

802.11n

2.4–2.5 GHz and 5.150–5.850 GHz Operating Frequency

802.11n Modulation

Rates (Mbps): MCS0 - MCS15 (6.5MBps - 300Mbps)

5 G (Mbps): 4x4 Multiple-In, Multiple-Out (MIMO) Radio

2.4 G (Mbps): 2x2 Multiple-In, Multiple-Out (MIMO) Radio

HT 20 High-Throughput (HT) Support (for both 2.4 GHz and 5 GHz)

HT 40 High-Throughput (HT) Support for 5 GHz

A-MPDU and A-MSDU Frame Aggregation

802.11ac

5.150–5.850 GHz Operating Frequency

802.11ac Modulation (256-QAM)

Rates (Mbps): MCS0 – MCS9 (6.5Mbps – 3467Mbps), NSS = 1-4

2x2:2 Stream Multiple-In, Multiple-Out (MIMO) Radio

VHT20/VHT40/VHT80 support

TxBF (Transmit Beamforming)

802.11ax (for 5 GHz Sensor)

5.150-5.850 GHz Operating Frequency

802.11ax Modulation (1024-QAM)

Dual-band OFDMA

Rates (Mbps): HE0 – HE11 (8Mbps –1200Mbps), NSS = 1-2

2x2:2 Stream Multiple-In, Multiple-Out (MIMO) Radio

VHT20/VHT40/VHT80/VHT160 support

TxBF (Transmit Beamforming)

802.11ax (for 5 GHz Radio)

2.4-2.5 GHz and 5.150-5.850 GHz Operating Frequencies

802.11ax Modulation (1024-QAM)

Dual-band OFDMA

5G Rate : HE0-HE11 (8 Mbps – 4800 Mbps)

2.4G Rate: HE0-HE11 (8Mbps – 574 Mbps)

4x4:4 Stream Multiple-In, Multiple-Out (MIMO) Radio

HE20/HE40/HE80/HE160 support for 5 GHz

HE20/HE40 support for 2.4 GHz

DL SU-MIMO and MU-MIMO

TxBF (Transmit Beamforming)

## Radios

BLE Radio Bluetooth® Low Energy (BLE) and IEEE® 802.15.4 compliant

Internal GPS - accuracy is 2.5m- 3m in open sky

## Interfaces

100/1000/2500 Mbps auto-negotiation Ethernet port, RJ45 PoE+ (Power over Ethernet 802.3at) Port

10/100/1000 Mbps auto-negotiation Ethernet port, RJ45

## Power Specifications

IEEE 802.3at PoE+ Power

## Power Options

Power Draw: Typical: 15.23W, Max: 19.78W

802.3at Power over Ethernet (PoE+) capable Gigabit Ethernet port (RJ-45 power input pins: Wires 4,5,7,8 or 1,2,3,6)

802.3af Power over Ethernet injector

## Physical

10" x 7.5" x 2.5" (260mm x 192mm x 65mm)

AP460i: 3.7 lbs (1.7 kg)

AP460e: 3.9 lbs (1.8 kg)

## AP460i - Internal Antennas

(2) Integrated single band, 2.4-2.5 GHz omnidirectional antennas

(4) Integrated single band, 5.1-5.8 GHz omnidirectional antennas

(2) Integrated dual band, 2.4-2.5 GHz and 5.1-5.8 GHz omnidirectional antennas for Sensor

(1) Integrated single band, 2.4-2.5 GHz omnidirectional antennas for BLE

## AP460e - External Antennas

8 Ntype connectors

1 Ntype connector for BLE

## Mounting

Pole Mount with 15 degree tilt

12" Extension arm

10" Extension w/2-axis 80 degree tilt

## Environmental Specifications

Operating: AP460i/e -40°C to 60°C (-40°F to 140°F)

Storage: -40°C to 70°C (-40°F to 158°F)

Humidity: 0% to 95% (non-condensing)

Wind Rating: 165 Mph sustained winds

Operational Shock: IEC60721-3-4, Class 4M3; ASTM D3332-99; MIL STD 810H Method 516

Operation Vibration: ASTM D3580-95, IEC60721-3-4, Class 4M3 (IEC 60068-2-64)

## Environmental Discharge

+/-8 kV contact and +/-15 kV air

## Environmental Compliance

Housing: IP67 rated outdoor use

Wind Gust for 165 mph

## Regulatory Compliance

Product Safety Certifications

IEC 60950-1, EN 60950-1, UL 60950-1, CSA 22.2 No.60950-1-03 AS/NZS 60950.1

RoHS Directive 2011/65/EU

## Radio Approvals

FCC CFR 47 part 15 Class B

FCC Subpart C 15.247

FCC Subpart E 15.407

ICES-003 Class B

IEC/EN 60601-1-2

RSS247

AS/NZS4268 + CISPR32

EN 50385

EN 50581

EN 55011, (Group 1, Class B)

EN 55024

EN 55032, (Class B)

EN 61000-3-2

EN 61000-3-3

EN 62311

EN 300 328

EN 301 489-1

EN 301 489-17

EN 301 893

IR2030/8/3

## Support

1 year warranty

# AP460 Peak Gain

| Software Mode | Radio 1 | Radio 2 | Radio 3 | IoT Radio |
|---|---|---|---|---|
| Dual Band Sensor | 2.4 GHz - 4.73 dBi | 5 GHz (4x4) - 5.36 dBi | 2.4 GHz: 4.8 dBi<br>5 GHz: 5 dBi | 4.37 dBi |

# AP460i

## Power and Receive Sensitivity – 2.4GHz

| Channel | Data Rate | Power (dBm) | Sensitivity (dBm) |
|---|---|---|---|
| 11b | 1-11Mbps | 23 | -96, -89 |
| 11g | 6Mbps | 23 | -92 |
| | 54Mbps | 22 | -75 |
| 11n HT20 | MCS0, 7 | 23, 22 | -92, -72 |
| 11n HT40 | MCS0, 7 | 23, 22 | -89, -69 |
| 11ax HE20 | HE0,11 | 23, 20 | -91, -62 |
| 11ax HE40 | HE0,11 | 23, 20 | -88, -59 |

## Power and Receive Sensitivity – 5 GHz

| Channel | Data Rate | Power (dBm) | Sensitivity (dBm) |
|---|---|---|---|
| 11a | 6Mbps | 22 | -95 |
| | 54Mbps | 20 | -77 |
| 11n HT20 | MCS0, 7 | 22, 18 | -94, -75 |
| 11n HT40 | MCS0, 7 | 22, 18 | -91, -72 |
| 11ac VHT20 | MCS0, 8 | 22, 17 | -94, -71 |
| 11ac VHT40 | MCS0, 9 | 22, 17 | -91, -66 |
| 11ac VHT80 | MCS0, 9 | 22, 17 | -88, -63 |
| 11ac VHT160 | MCS0, 9 | 22, 17 | -85, -60 |
| 11ax HE20 | HE0,11 | 22, 16 | -93, -63 |
| 11ax HE40 | HE0,11 | 22, 16 | -90, -60 |
| 11ax HE80 | HE0,11 | 22, 16 | -87, -57 |
| 11ax HE160 | HE0,11 | 22, 16 | -84, -54 |

## (Sensor) Receive Sensitivity – 2.4 GHz

| Channel | Data Rate | Sensitivity (dBm) |
|---|---|---|
| 11b | 1-11Mbps | -95, -88 |
| 11g | 6Mbps | -91 |
| | 54Mbps | -74 |
| 11n HT20 | MCS0, 7 | -91, -71 |
| 11n HT40 | MCS0, 7 | -88, -68 |
| 11ax HE20 | HE0,11 | -90, -61 |
| 11ax HE40 | HE0,11 | -87, -58 |

## Receive Sensitivity – 5 GHz

| Channel | Data Rate | Power (dBm) |
|---|---|---|
| 11a | 6Mbps | -94 |
| | 54Mbps | -76 |
| 11n HT20 | MCS0, 7 | -93, -73 |
| 11n HT40 | MCS0, 7 | -90, -70 |
| 11ac VHT20 | MCS0, 8 | -93, -69 |
| 11ac VHT40 | MCS0, 9 | -90, -64 |
| 11ac VHT80 | MCS0, 9 | -86, -61 |
| 11ax HE20 | HE0,11 | -92, -62 |
| 11ax HE40 | HE0,11 | -89, -59 |
| 11ax HE80 | HE0,11 | -86, -56 |

# AP460e

## Power and Receive Sensitivity – 2.4 GHz

| Channel | Data Rate | Power (dBm) | Sensitivity (dBm) |
|---|---|---|---|
| 11b | 1-11Mbps | 23 | -95, -88 |
| 11g | 6Mbps | 22 | -91 |
| | 54Mbps | 21 | -74 |
| 11n HT20 | MCS0, 7 | 22, 21 | -91, -71 |
| 11n HT40 | MCS0, 7 | 22, 21 | -88, -68 |
| 11ax HE20 | HE0,11 | 22, 19 | -90, -61 |
| 11ax HE40 | HE0,11 | 22, 19 | -87, -58 |

## Power and Receive Sensitivity – 5 GHz

| Channel | Data Rate | Power (dBm) | Sensitivity (dBm) |
|---|---|---|---|
| 11a | 6Mbps | 20 | -93 |
| | 54Mbps | 18 | -75 |
| 11n HT20 | MCS0, 7 | 20, 16 | -92, -73 |
| 11n HT40 | MCS0, 7 | 20, 16 | -89, -70 |
| 11ac VHT20 | MCS0, 8 | 20, 15 | -92, -69 |
| 11ac VHT40 | MCS0, 9 | 20, 15 | -89, -64 |
| 11ac VHT80 | MCS0, 9 | 20, 15 | -86, -61 |
| 11ac VHT160 | MCS0, 9 | 20, 15 | -83, -58 |
| 11ax HE20 | HE0,11 | 20, 14 | -91, -61 |
| 11ax HE40 | HE0,11 | 20, 14 | -88, -58 |
| 11ax HE80 | HE0,11 | 20, 14 | -85, -55 |
| 11ax HE160 | HE0,11 | 20, 14 | -82, -52 |

## (Sensor) Receive Sensitivity – 2.4 GHz

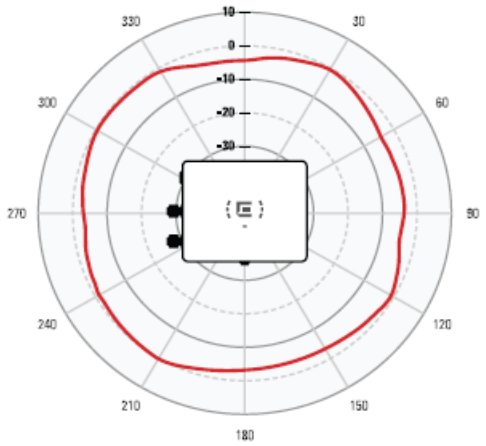
| Channel | Data Rate | Sensitivity (dBm) |
|---|---|---|
| 11b | 1-11Mbps | -94, -87 |
| 11g | 6Mbps | -90 |
| | 54Mbps | -73 |
| 11n HT20 | MCS0, 7 | -90, -70 |
| 11n HT40 | MCS0, 7 | -87, -67 |
| 11ax HE20 | HE0,11 | -89, -60 |
| 11ax HE40 | HE0,11 | -86, -57 |

## Receive Sensitivity – 5 GHz

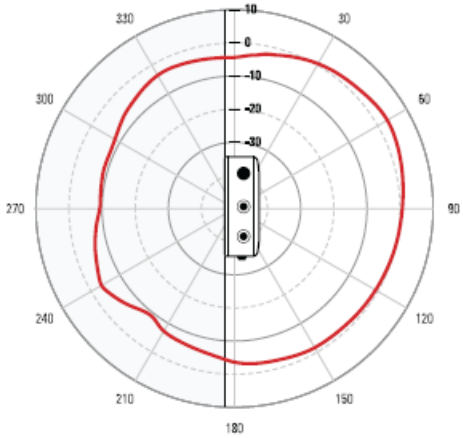
| Channel | Data Rate | Power (dBm) |
|---|---|---|
| 11a | 6Mbps | -93 |
| | 54Mbps | -75 |
| 11n HT20 | MCS0, 7 | -92, -73 |
| 11n HT40 | MCS0, 7 | -89, -70 |
| 11ac VHT20 | MCS0, 8 | -92, -69 |
| 11ac VHT40 | MCS0, 9 | -89, -64 |
| 11ac VHT80 | MCS0, 9 | -86, -61 |
| 11ax HE20 | HE0,11 | -91, -61 |
| 11ax HE40 | HE0,11 | -88, -58 |
| 11ax HE80 | HE0,11 | -85, -55 |

## Antenna Radiation Patterns

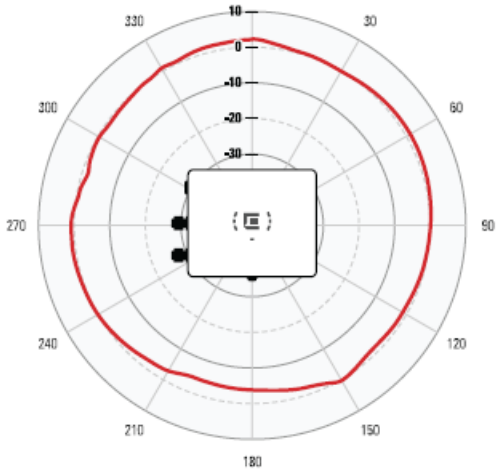
### Azimuth – 2.4 GHz



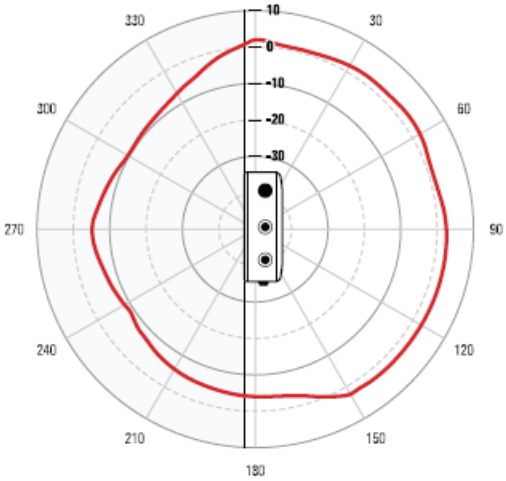

### Elevation – 2.4 GHz




### Azimuth – 5 GHz

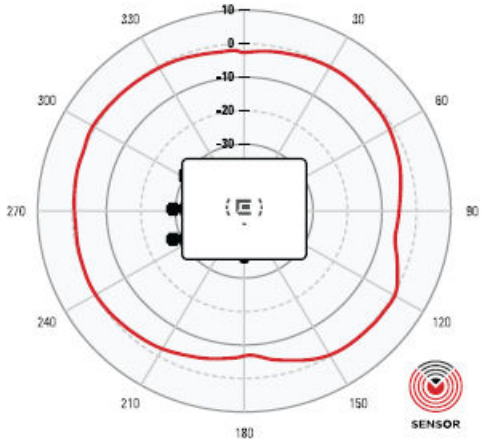



### Elevation – 5 GHz

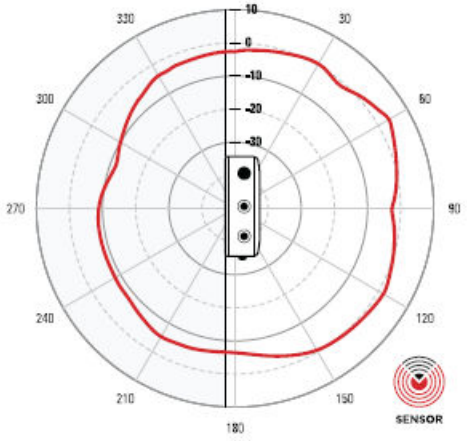


## Antenna Sensor Patterns

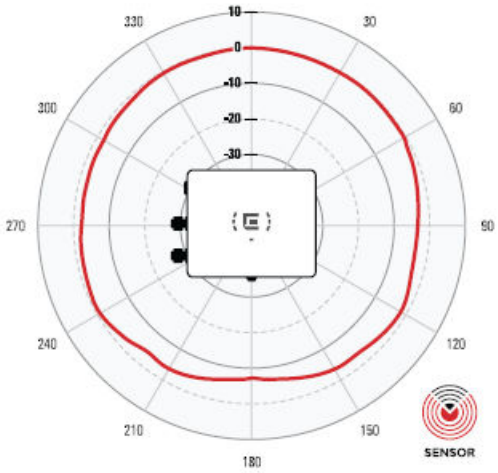
### Azimuth – 2.4 GHz



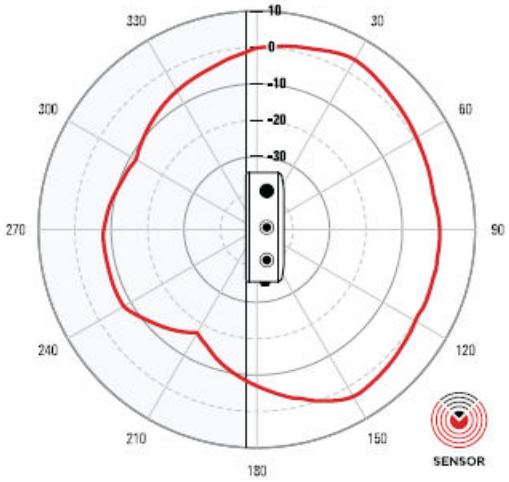

### Elevation – 2.4 GHz




### Azimuth – 5 GHz




### Elevation – 5 GHz



# Ordering Information

### AP460i/e

| Mkt Part # | Description |
|---|---|
| AP460i-FCC | Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor Internal Antenna Access Point. Domain: US, and Puerto Rico |
| AP460i-CAN | Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor Internal Antenna Access Point. Domain: Canada |
| AP460i-WR | Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor Internal Antenna Access Point. Domain: EMEA, Rest of World |
| AP460i-IL | Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor Internal Antenna Access Point. Domain: Israel |
| AP460e-FCC | Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor External Antenna Access Point. Domain: US, and Puerto Rico |
| AP460e-CAN | Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor External Antenna Access Point. Domain: Canada |
| AP460e-WR | Tri Radio 802.11ax - 4x4:4 + 2x2:2, Full time 2x2:2 Sensor, Outdoor External Antenna Access Point. Domain: EMEA, Rest of World |

### AP460i/e - Mounting Options

| Mkt Part # | Description |
|---|---|
| Use KT-147407-02 for pole mounting - 15 degree tilt | |
| KT-147407-02 | OUTDOOR MOUNTING HARDWARE KIT FOR OUTDOOR ACCESS POINTS- STAINLESS STEEL FOR HARSH ENVIRONMENTS |
| KT-150173-01 use with KT-147407-02 to extend AP 12 inches from the pole - typically used with the AP460e | |
| KT-150173-01 | OUTDOOR AP 12 IN EXT ARM FOR MNTG KIT |
| WS-MBO-POLE01 bracket can only be used with the MBO-ART02 articulating mounting bracket - | |
| 30520 | WS-MBO-POLE01 POLE MTG BRKT |
| MBO-ART02 | MBO-ART02 Articulating Mtg Brkt |

### AP460i/e - Power Options

| Mkt Part # | Description |
|---|---|
| PD-9001GO-ENT | OUTDOOR 802.3AT POE SINGLE PORT MIDSPAN |

### AP460i/e - Antennas

| Mkt Part # | Description |
|---|---|
| ML-2452-HPAG4A6-01 | Dipole, 4dBi/ 7.3dBi, dual band, outdoor, white with standard N plug connector (up to 5 per AP) |
| ML-2452-PNA5-01R | Panel, 120 deg sector, 4.5dBi/ 5dBi, dual band, outdoor, 4” lead with standard N plug connector (up to 5 per AP) |
| ML-2452-HPAG5A8-01 | Dipole Omni, 5dBi/7.5dBi/8dBi, dual band, outdoor with standard N Plug connector (up to 5 per AP) |
| ML-2452-HPA6-01 | Dipole Omni, 5.3/4.6/6.1dBi, dual band, outdoor with standard N Plug connector (up to 5 per AP) |
| ML-2452-PNA7-01R | Panel, 68/ 52 deg sector, 7.8dBi/ 10.7dBi, dual band, outdoor, 4" lead with standard N plug connector (up to 5 per AP) |
| 30724 | WS-AO-DQ04360N Outdoor, 2.4-2.5/5.15-5.875GHz, 4-feed 4dBi, Omni antenna with standard N-type plug connector |