

AC15001-NJ WiFi Compact Dome Panel-Mount Antenna

The AC15001 N-connector dome antennas provide robust compact, outdoor, omnidirectional WiFi antenna solutions for all WiFi applications including WiFi 6 and WiFi 7. Each antenna supports IP67 and IP65 ingress protection as well as IK-10 impact resistance, all under an attractive, UV-resistant, dome. The 82 mm x 40mm mounted size combines excellent antenna performance with a compact low-profile that fits in many applications from mobile/vehicular roof-mount to fixed vending machine use, and supports use on both metal enclosures or in free space including non-metallic enclosures.

The AC15001 compact dome antennas are available in two colors, black and white, with fine matte finish, and two termination options: 24mm N-connector jack, and 14mm N-connector jack for thin/limited area mounts. Similar-performing NMO-terminated (AC15001-NM) and cabled (AC17001) compact dome antennas are also available.



AC15001-NJW Compact Dome Panel-Mount Antenna

Features

- Very high efficiency
- IP67/IP65 ingress protection
- IK10 impact resistance
- O-ring mounting seal
- UV resistance
- Salt Spray resistance
- Ground plane independent
- Dimensions: 82 mm x 40 mm
- 24 mm and 14 mm N-connector termination options
- Performance at 5.15 GHz to 5.85 GHz
 - VSWR: 1.6
 - Peak Gain: 7.6 dBi
 - Efficiency: 88%

Applications

- WiFi/WLAN Coverage
 - WiFi 7 (802.11be)
 - WiFi 6E (802.11ax)
 - WiFi 6 (802.11ax)
 - WiFi 5 (802.11ac)
 - WiFi 4 (802.11n)
 - 802.11b/g
- 2.4 GHz ISM applications
 - Bluetooth®
 - ZigBee®
- U-NII bands 1-8
- Internet of Things (IoT) devices
- WLAN Gateways/Routers
- Customer Premise Equipment (CPE)
 - Fixed wireless
 - Outdoor CPE
- Automotive/vehicular/OHV

Ordering Information

Part Number	Description
AC15001-NJB	Black 24 mm N-connector jack WiFi compact dome antenna
AC15001-NJW	White 24 mm N-connector jack WiFi compact dome antenna
AC15001-2NJB	Black 14 mm N-connector jack WiFi compact dome antenna
AC15001-2NJW	White 14 mm N-connector jack WiFi compact dome antenna

See the AC17001 compact dome antennas for cabled options and AC15001-NM for NMO termination options. Available from The Antenna Company (sales@antennacompany.com) and select distributors and representatives.

Electrical Specifications

AC15001-NJ	ISM/WiFi	WiFi/U-NII 1-4	WiFi/U-NII 5-8
Parameter	2400 MHz to 2500 MHz	5150 MHz to 5850 MHz	5900 MHz to 7150 MHz
VSWR (max)	1.7	1.6	1.8
Peak Gain (dBi)	3.8	7.6	7.1
Average Gain (dBi)	-1.2	-0.5	-1.1
Average Efficiency (%)	75	88	78
Impedance	50 Ω		
Polarization	Linear		
Radiation Pattern	Omnidirectional		
Wavelength	$\frac{1}{2}$ -wave		
Maximum Input Power	10W		
Electrical Type	Dipole		

Electrical specifications and plots measured with the antenna mounted at the center of a 300 mm x 300 mm ground plane.

Mechanical Specifications

Parameter	Value
Antenna Connection (Termination)	N Jack, 24 mm or 14 mm
Available Panel Mount Thickness (washer, nut and N plug attached)	AC15001-NJx = 10 mm AC15001-2NJx = 1.5 mm
Mounting torque	1.0 - 1.5 Nm
Weight	AC15001-NJx = 119.07 g (4.2 oz) AC15001-2NJx = 107.73 g (3.8 oz)
Dimensions (mounted)	82.0 mm x \varnothing 40.0 mm (3.23 in x \varnothing 1.57 in)

Environmental Specifications

Parameter	Value
Operating Temp. Range	-40 $^{\circ}$ C to +85 $^{\circ}$ C (-104 $^{\circ}$ F to 185 $^{\circ}$ F)
Operating Relative Humidity	\leq 98%
Ingress Protection	IP67, IP65
Impact Resistance	IK10
Flammability Rating	UL 94-HB
Salt Spray	MIL-STD 810F/STM B117
Wind Resistance (max.)	300 km/hr (186 mi/hr)

Antenna Dimensions

The dimensions for the AC15001-NJ antennas are shown below in Figure 1.

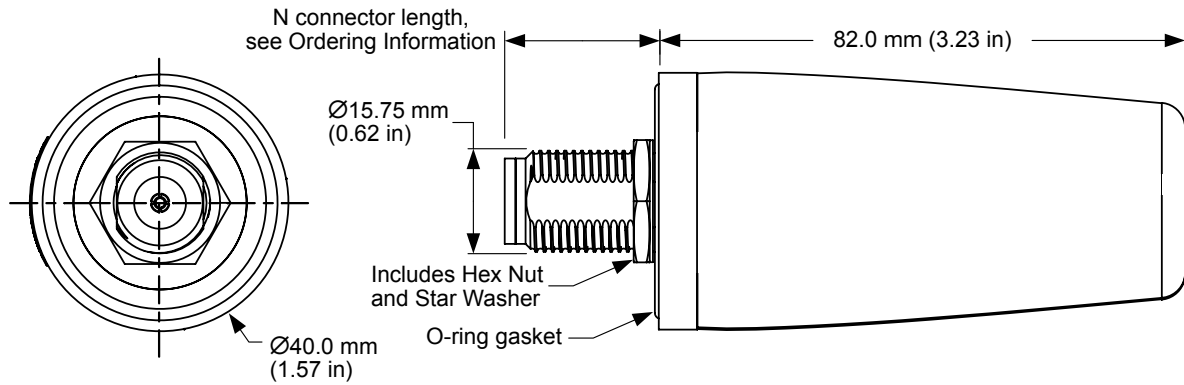


Figure 1. AC15001 Antenna Dimensions

Mounting Dimensions

The mounting dimensions for the AC15001-NJ antennas are shown in Figure 2.

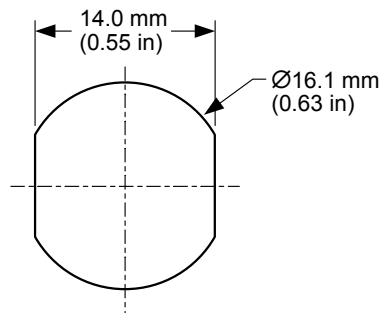


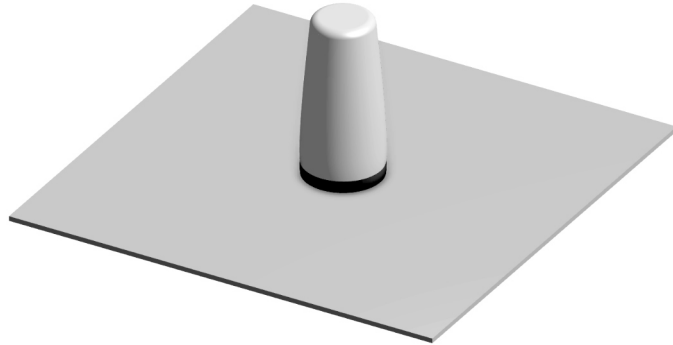
Figure 2. AC15001-NJ Antenna Mounting Dimensions

Antenna Test Orientations

The AC15001 antenna is characterized in two antenna orientations as shown in Figure 3. Although the antenna does not require a ground plane to function, characterization on an adjacent ground plane (300 mm x 300 mm) provides insight into antenna performance when attached directly on a metal enclosure. The antenna free space orientation characterizes use of an antenna attached to a non-metallic enclosure. These two orientations represent common end-product use cases.



Antenna in Free space



Antenna on Ground Plane

Figure 3. AC15001 Antenna Test Orientations

On Ground Plane

The charts on the following pages represent data taken with the antenna oriented at the center of the 300 mm x 300 mm metal plate as shown in Figure 4.

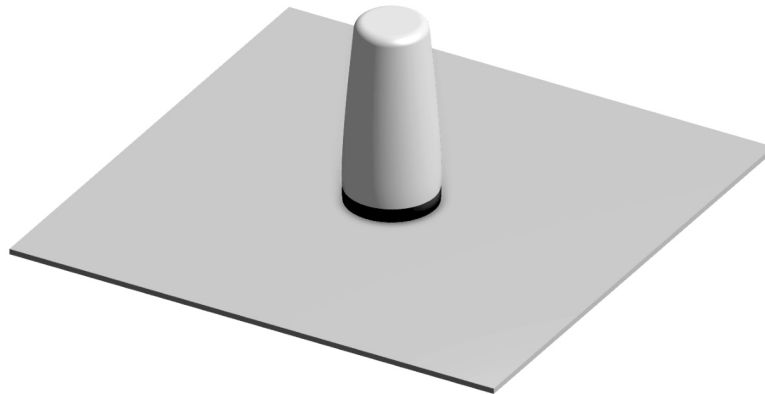


Figure 4. AC15001 Antenna On Ground Plane

VSWR

Figure 5 provides the voltage standing wave ratio (VSWR) across the antenna bandwidth. VSWR characterizes the power reflected from the antenna back to the transmitter. A lower VSWR value indicates better antenna performance at a given frequency. Reflected power is also shown on the right-side vertical axis as a measure of the percentage of transmitter power reflected back from the antenna.

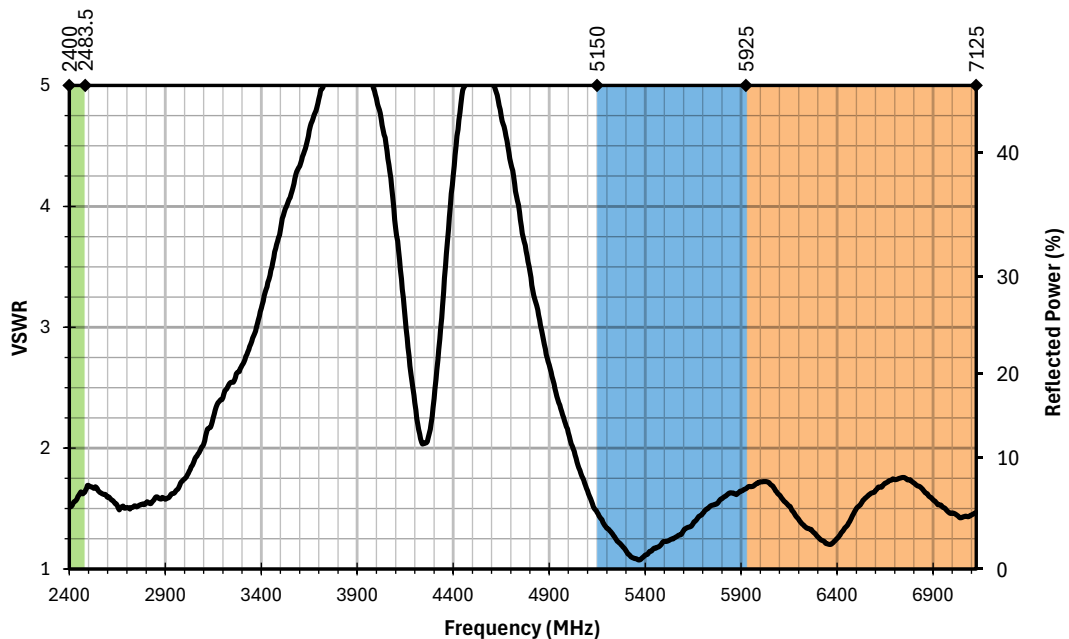


Figure 5. AC15001 Antenna VSWR on Ground Plane

Return Loss

Return loss (Figure 6) represents the loss in power at the antenna due to reflected signals. A higher magnitude return loss indicates better performance. Return loss is the negative of input reflection coefficient, in decibels (dB), and the two values are often used interchangeably.

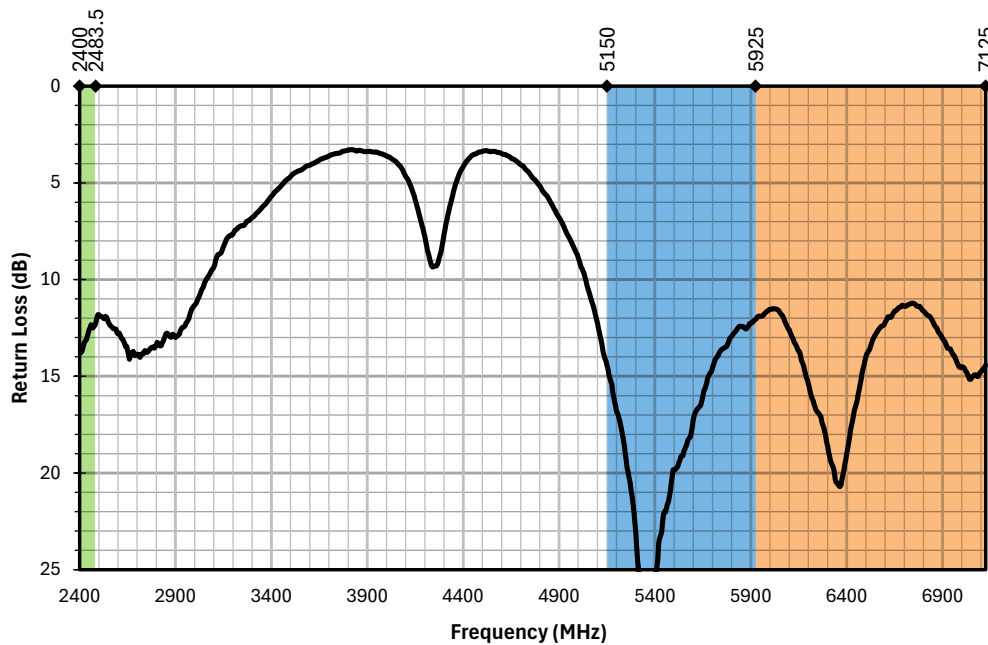


Figure 6. AC15001 Antenna Return Loss on Ground Plane

Peak Gain

Peak gain (Figure 7) provides a measure of the maximum conversion of antenna input power to radio waves at a given frequency. Peak gain does not account for the directionality of gain in 3-dimensional space.

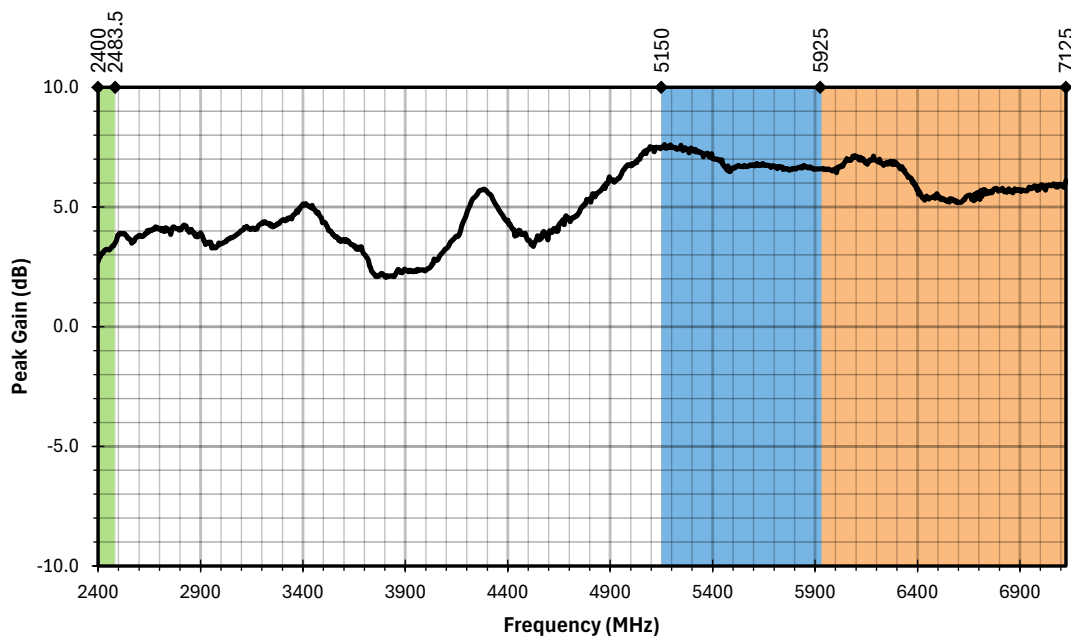


Figure 7. AC15001 Antenna Peak Gain on Ground Plane

Average Gain

Average gain (Figure 8) is the average of all antenna gain in 3-dimensional space at each frequency, providing an indication of overall performance without expressing antenna directionality.

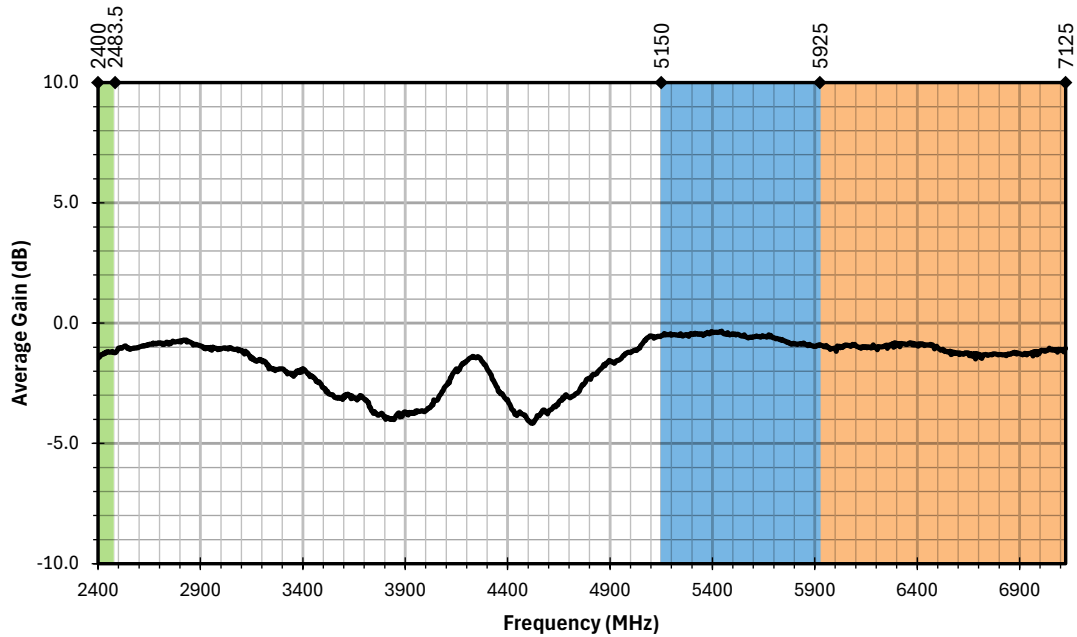


Figure 8. AC15001 Antenna Average Gain on Ground Plane

Efficiency

Efficiency (Figure 9) is the ratio of power delivered to the antenna relative to the power radiated at the antenna, expressed as a percentage, where a higher percentage indicates better performance at a given frequency.

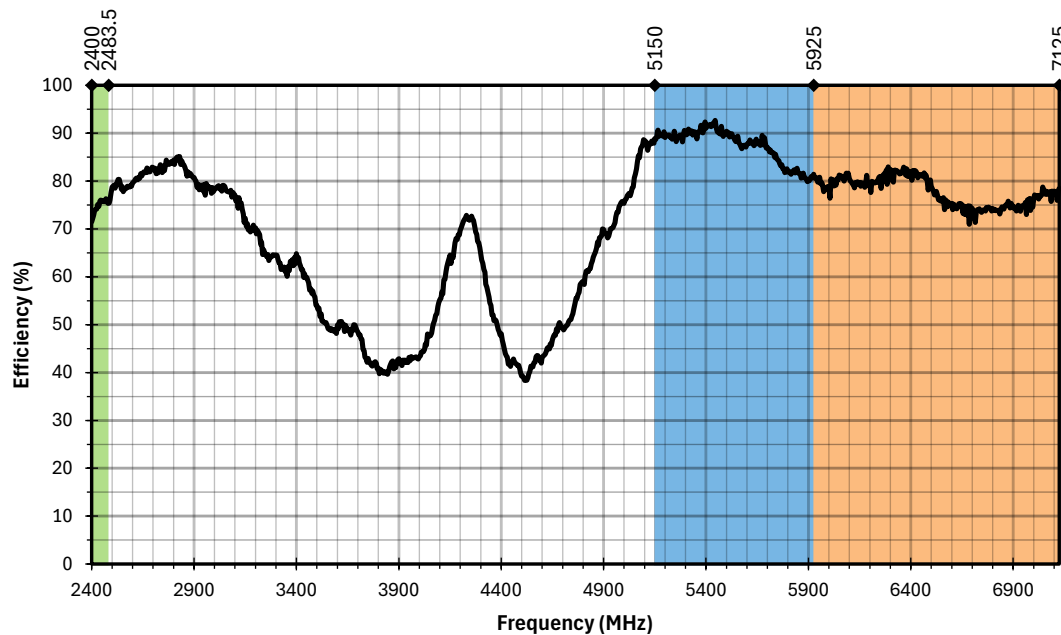
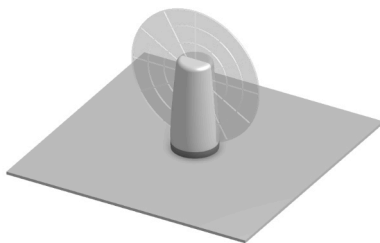


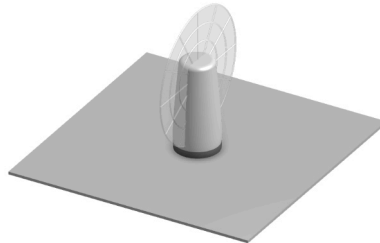
Figure 9. AC15001 Antenna Efficiency on Ground Plane

Radiation Patterns - On Ground Plane

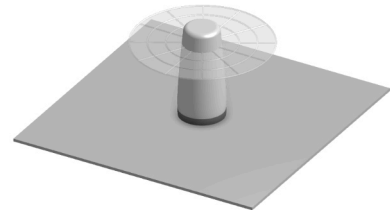
Radiation patterns provide information about the directional performance of the antenna by plotting gain in three orthogonal planes at the high-, low- and center-frequencies of an antenna frequency band. Antenna radiation patterns (Figure 10) are shown using polar plots covering 360 degrees with the plane of reference depicted above the plots. Note: when viewed with typical PDF viewing software, zooming into radiation patterns is possible to reveal fine detail.



XZ-Plane Gain

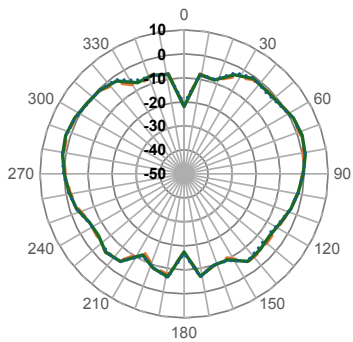


YZ-Plane Gain

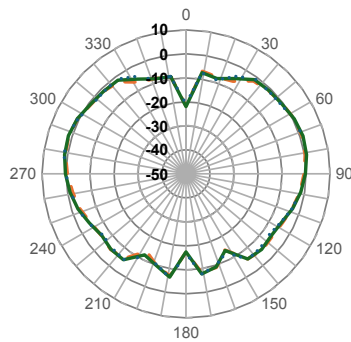


XY-Plane Gain

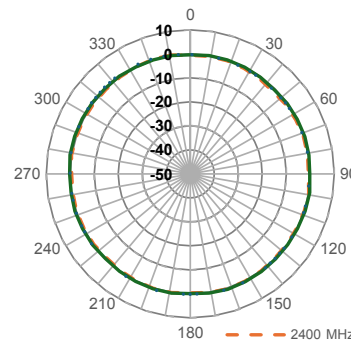
2400 MHz to 2500 MHz (2450 MHz)



XZ-Plane Gain



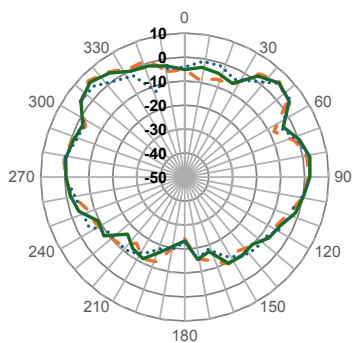
YZ-Plane Gain



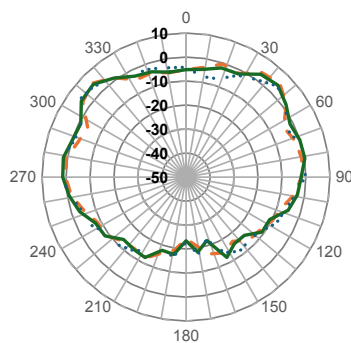
XY-Plane Gain

--- 2400 MHz
 — 2445 MHz
 ... 2485 MHz

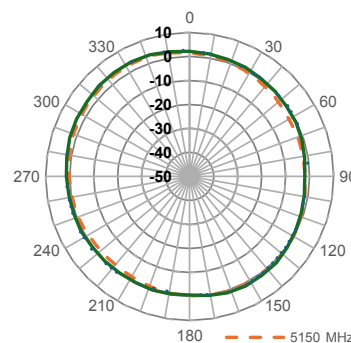
5150 MHz to 5895 MHz (5520 MHz)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

--- 5150 MHz
 — 5500 MHz
 .. 5850 MHz

5925 MHz to 7125 MHz (6525 MHz)

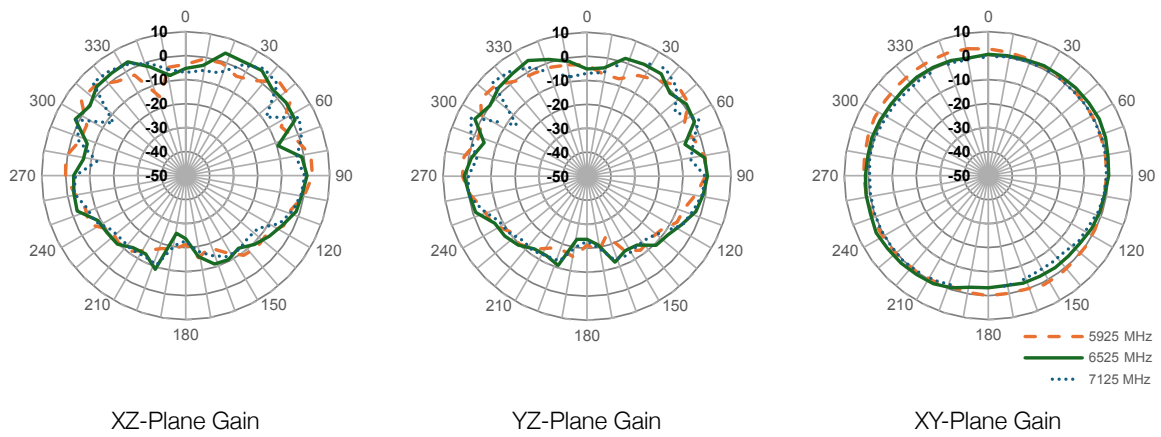


Figure 10. Radiation Patterns for AC15001 Antenna on Ground Plane

Free Space, No Ground Plane

The charts on the following pages represent data taken with the antenna in free space as shown in Figure 11.

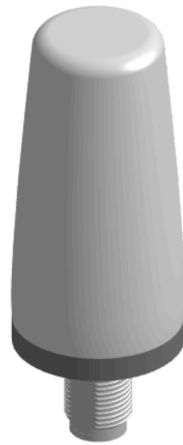


Figure 11. AC15001 Antenna, Free Space, no Ground Plane

VSWR

Figure 12 provides the voltage standing wave ratio (VSWR) across the antenna bandwidth. VSWR characterizes the power reflected from the antenna back to the transmitter. A lower VSWR value indicates better antenna performance at a given frequency. Reflected power is also shown on the right-side vertical axis as a measure of the percentage of transmitter power reflected back from the antenna.

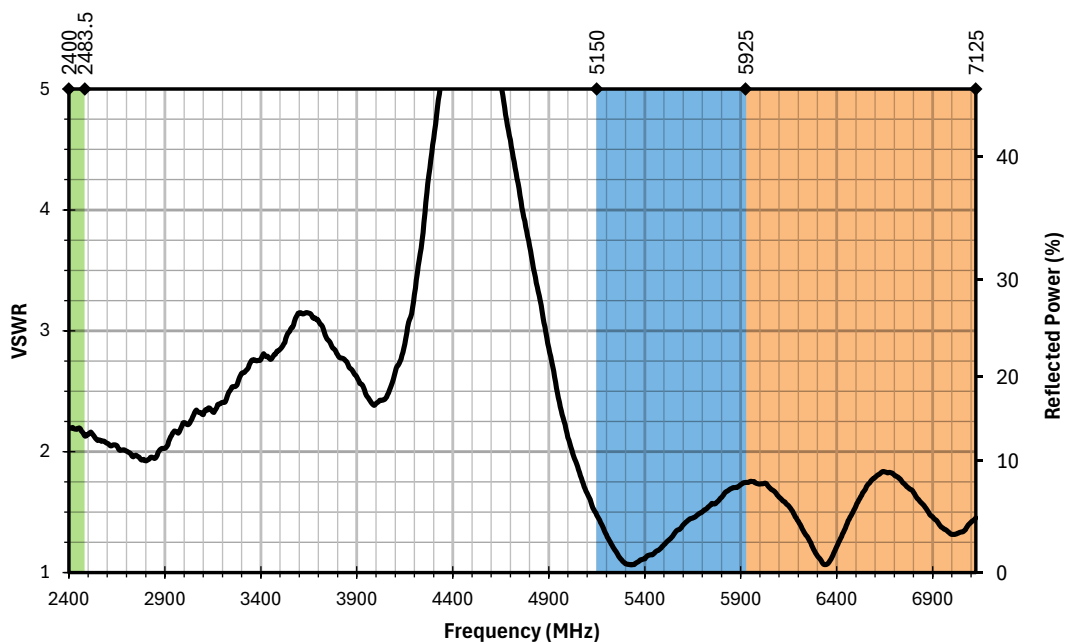


Figure 12. AC15001 Antenna VSWR, Free Space

Return Loss

Return loss (Figure 13) represents the loss in power at the antenna due to reflected signals. A higher magnitude return loss indicates better performance. Return loss is the negative of input reflection coefficient, in decibels (dB), and the two values are often used interchangeably.

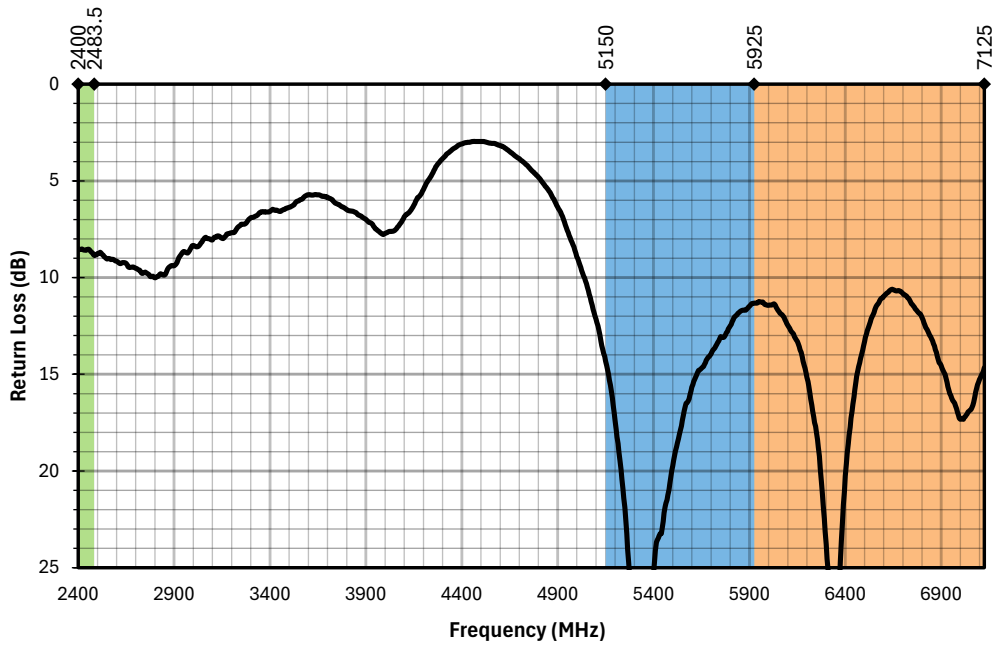


Figure 13. AC15001 Antenna Return Loss, Free Space

Peak Gain

Peak gain (Figure 14) provides a measure of the maximum conversion of antenna input power to radio waves at a given frequency. Peak gain does not account for the directionality of gain in 3-dimensional space.

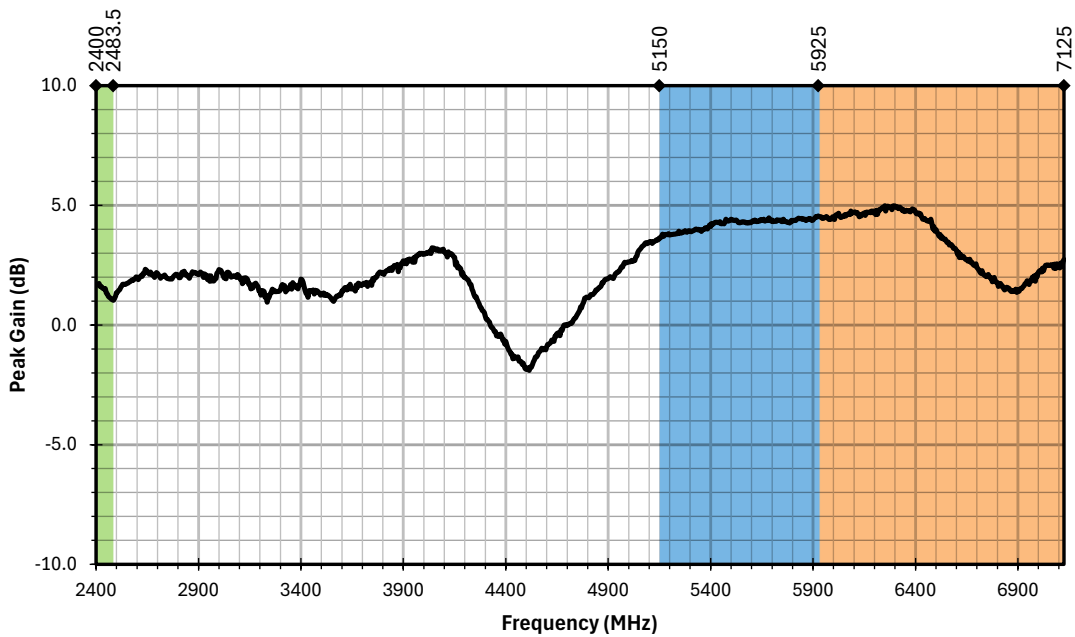


Figure 14. AC15001 Antenna Peak Gain, Free Space

Average Gain

Average gain (Figure 15) is the average of all antenna gain in 3-dimensional space at each frequency, providing an indication of overall performance without expressing antenna directionality.

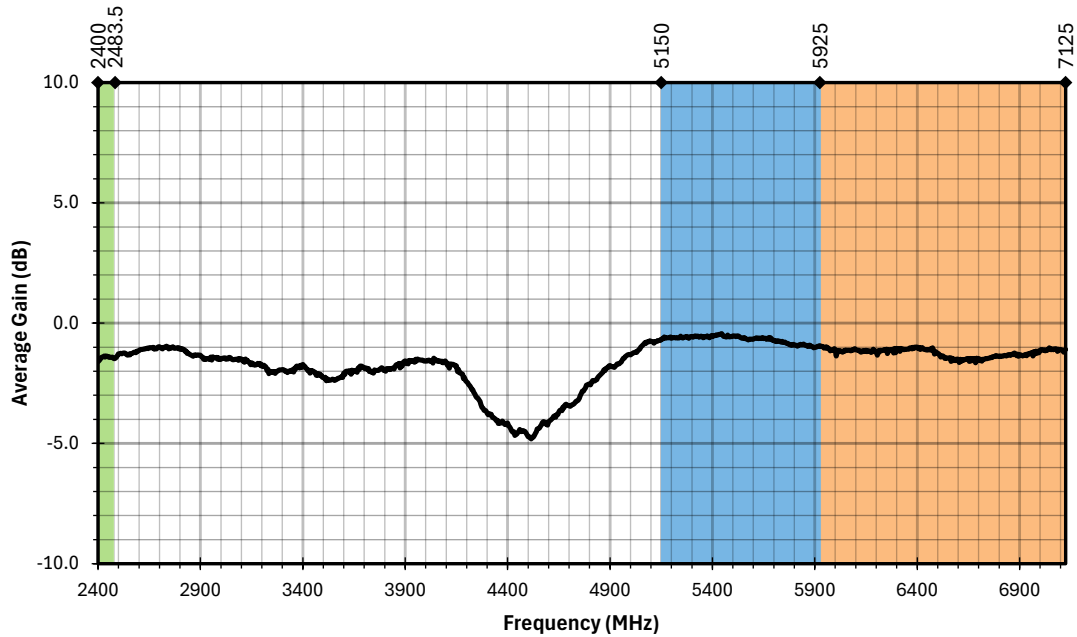


Figure 15. AC15001 Antenna Average Gain, Free Space

Efficiency

Efficiency (Figure 16) is the ratio of power delivered to the antenna relative to the power radiated at the antenna, expressed as a percentage, where a higher percentage indicates better performance at a given frequency.

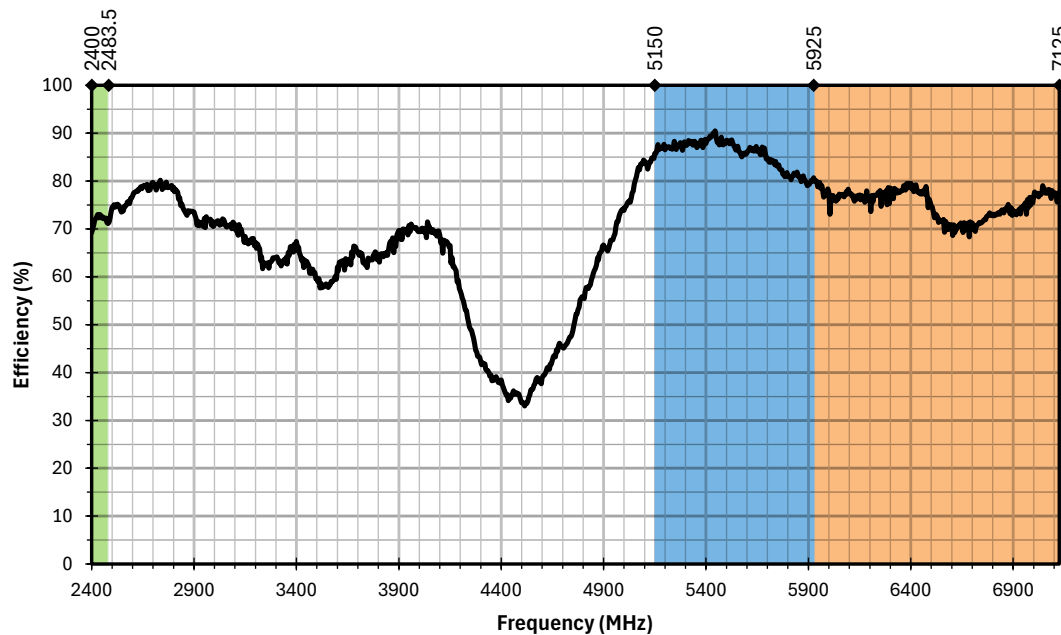


Figure 16. AC15001 Antenna Efficiency, Free Space

Radiation Patterns - Free Space

Radiation patterns provide information about the directional performance of the antenna by plotting gain in three orthogonal planes at the high-, low- and center-frequencies of an antenna frequency band. Antenna radiation patterns (Figure 17) are shown using polar plots covering 360 degrees with the plane of reference depicted above the plots. Note: when viewed with typical PDF viewing software, zooming into radiation patterns is possible to reveal fine detail.



XZ-Plane Gain

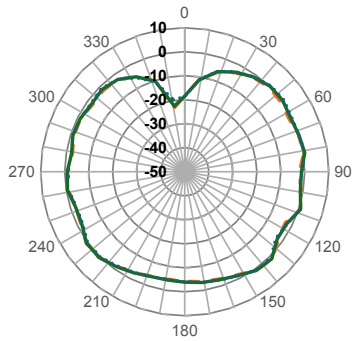


YZ-Plane Gain

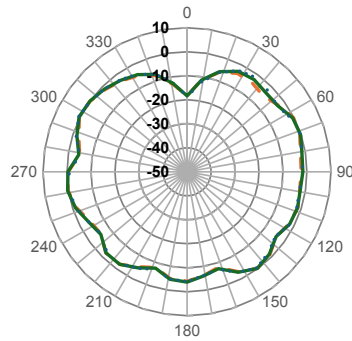


XY-Plane Gain

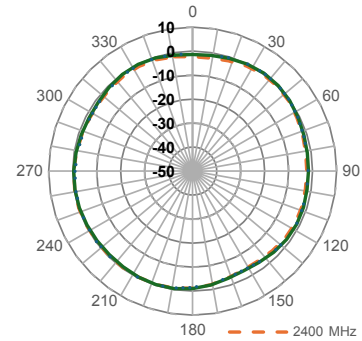
2400 MHz to 2500 MHz (2450 MHz)



XZ-Plane Gain



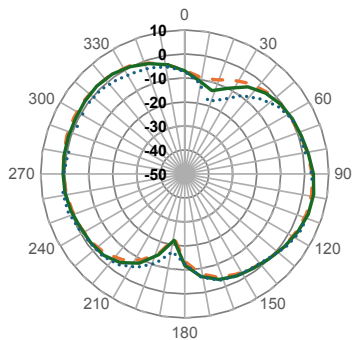
YZ-Plane Gain



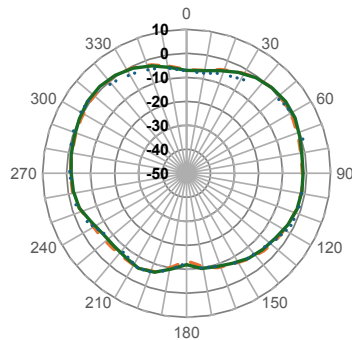
XY-Plane Gain

--- 2400 MHz
 — 2445 MHz
 ... 2485 MHz

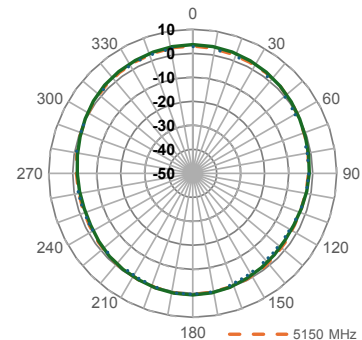
5150 MHz to 5895 MHz (5520 MHz)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

--- 5150 MHz
 — 5500 MHz
 ... 5850 MHz

5925 MHz to 7125 MHz (6525 MHz)

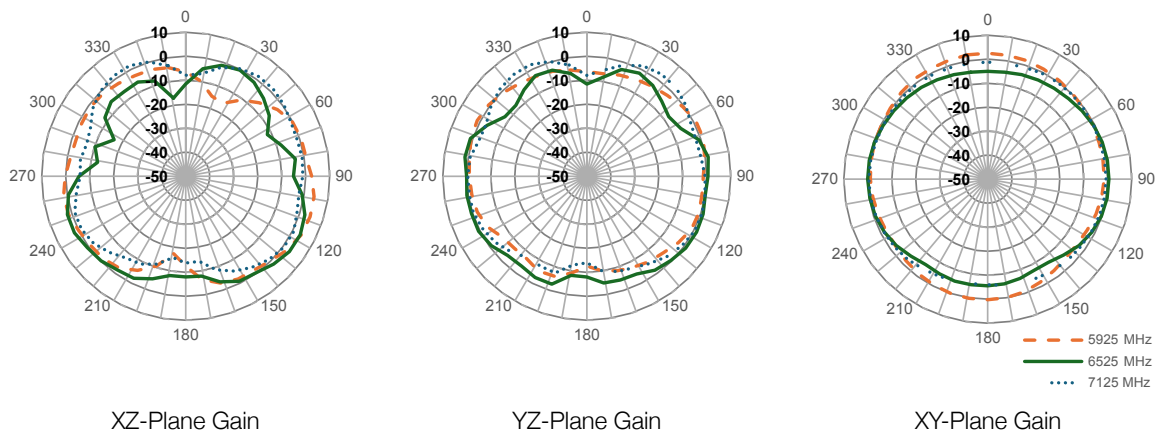
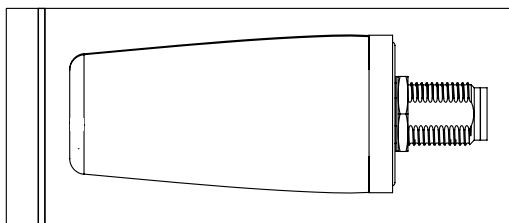


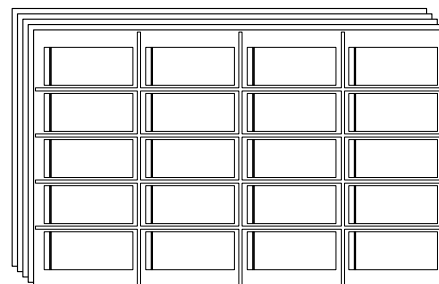
Figure 17. Radiation Patterns for AC15001 Antenna in Free Space

Packaging Information

The AC15001 antennas are individually packaged in a resealable polyethylene bag. Bagged antennas are placed in “honeycomb” divided pockets in a carton at 100 antennas per carton. 5 layers of 20 antennas per layer. Layers are separated by protective sheets. Carton dimensions are 590 mm x 290 mm x 270 mm (23.23 in x 11.42 in x 10.63 in).



Antenna in resealable bag



Antennas arranged in layers

Figure 18. Packing Materials and Specifications

Regional Environmental Regulation Compliance

Region	Regulation	Reference
United States	US EPA Toxic Substances Control Act amended December 2020 Declaration	TSCA Section 6(h)
United States	California Proposition 65 Safe Drinking Water & Toxic Enforcement Act of 1986 Declaration	HSC division 20 chapter 6.6
European Union	RoHS 3	EU 2015/863
European Union	EU REACH	EU 1907/2006
Worldwide	Responsible Minerals Initiatives	Dodd Frank act 1502; EU 2017/821
European Union	Persistent Organic Pollutants	(EU) 2019/1021
European Union	Packaging Directive	94/62/EC
European Union	PFOA Free	2006/122/ECOF

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EMAIL: sales@antennacompany.com

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Series: Compact Dome.

Patent Pending.

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