

AC16000 WiFi Tilt/Swivel Blade Antenna

The Antenna Company AC16000 tilt/swivel blade antennas provide robust indoor/outdoor, omnidirectional, WiFi antenna solutions for all WiFi applications including WiFi 7 as well as ISM applications including Bluetooth®, BLE and ZigBee®. The hinged base allows for fixed positioning of the antenna at 0 degrees (straight), 45 degrees and 90 degrees (right angle) to support use in many configurations including single-antenna (SISO) and MIMO IoT applications. The swivel connector allows for easy installation and firm positioning for optimal performance.

Beyond the capability of most blade antennas, AC16000 blade antennas support IP67 and IP65 ingress protection and UV-resistant materials for outdoor applications. The AC16000 blade antennas are available in black and white, with fine matte finish, and SMA or reverse-polarity SMA (RPSMA) connection.



AC16000-SMAB WiFi
Tilt/Swivel Blade Antenna

Features

- Very high efficiency
 - >93%
- VSWR under 1.6
- IP67/IP65 ingress protection
- UV resistance
- Ground plane independence
- Dimensions: 152 mm x 25 mm
- SMA and RPSMA termination options

Applications

- WiFi/WLAN Coverage
 - WiFi 7 (802.11be)
 - WiFi 6E (802.11ax)
 - WiFi 6 (802.11ax)
 - WiFi 5 (802.11ac)
 - WiFi 4 (802.11n)
 - IEEE 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)

Ordering Information

Part Number	Description
AC16000-SMAB	Black SMA-connector hinge/swivel WiFi blade antenna
AC16000-RPSB	Black RPSMA-connector hinge/swivel WiFi blade antenna
AC16000-SMAW	White SMA-connector hinge/swivel WiFi blade antenna
AC16000-RPSW	White RPSMA-connector hinge/swivel WiFi blade antenna

Available from The Antenna Company (sales@antennacompany.com) and select distributors and representatives.

RF/Electrical Specifications

AC16000	ISM/WiFi	WiFi/U-NII 1-4	WiFi/U-NII 5-8
Parameter	2400 MHz to 2485 MHz	5150 MHz to 5850 MHz	5925 MHz to 7125 MHz
VSWR (max)	1.6	1.5	1.6
Peak Gain (dBi)	3.0	5.9	5.7
Average Gain (dBi)	-0.5	-0.4	-0.5
Average Efficiency (%)	90	90	90
Impedance	50 Ω		
Polarization	Linear		
Radiation Pattern	Omnidirectional		
Wavelength	$\frac{1}{2}$ -wave		
Max Power	10 W		
Electrical Type	Dipole		

Electrical specifications and plots measured with the antenna mounted at the edge of a 100 mm x 100 mm ground plane, bent 90 degrees.

Mechanical Specifications

Part Number	Value
Connection	SMA or RPSMA
Ingress Protection	IP67, IP65
Operating Temp. Range	-40 °C to +85 °C (-40 °F to 185 °F)
Dimensions	151.6 mm x 25.0 mm x 13.0 mm (Straight) (5.97 in x 0.98 in x 0.51 in)
Weight	23.0 g (0.81 oz)

Antenna Dimensions

Figure 1 provides dimensions of the AC16000 antenna. The antenna whip can be tilted 90 degrees, with a detent at 45 degrees enabling the antenna to be oriented in any direction. The rotating base allows for continuous positioning through 360 degrees even while installed.

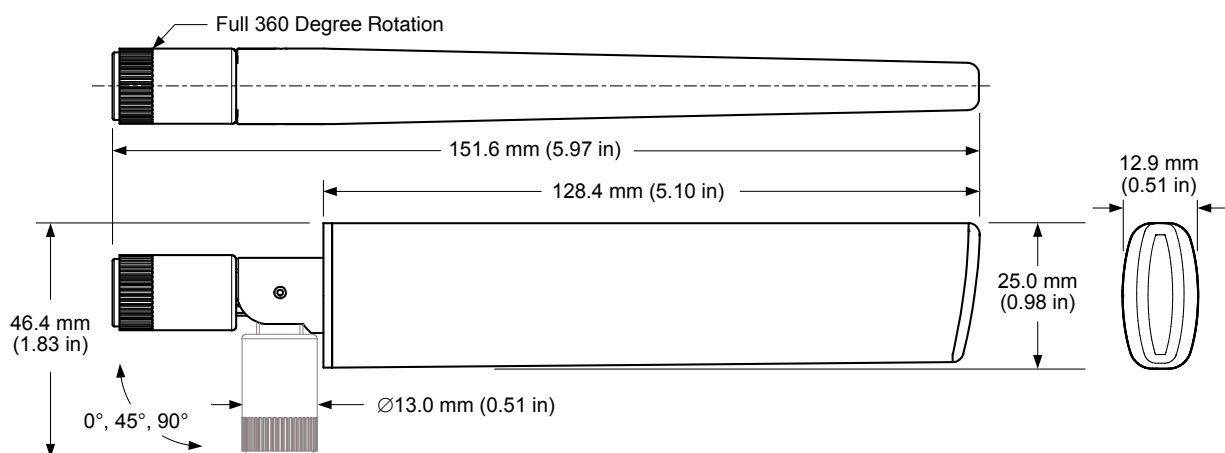


Figure 1. AC16000 Antenna Dimensions

Antenna Test Orientations

The AC16000 antenna is characterized in two antenna orientations as shown in Figure 2. Although the antenna does not require a ground plane to function, characterization on an adjacent ground plane (100 mm x 100 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 Bent 90 Degrees at Edge of Ground Plane



Antenna in Free space

Figure 2. AC16000 Test Orientations

Edge of Ground Plane

The charts on the following pages represent data taken with the antenna oriented at the edge of a 100 mm x 100 mm ground plane as shown in Figure 3.



Figure 3. AC16000 Antenna at Edge of Ground Plane, Bent 90 Degrees

VSWR

Figure 4 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.

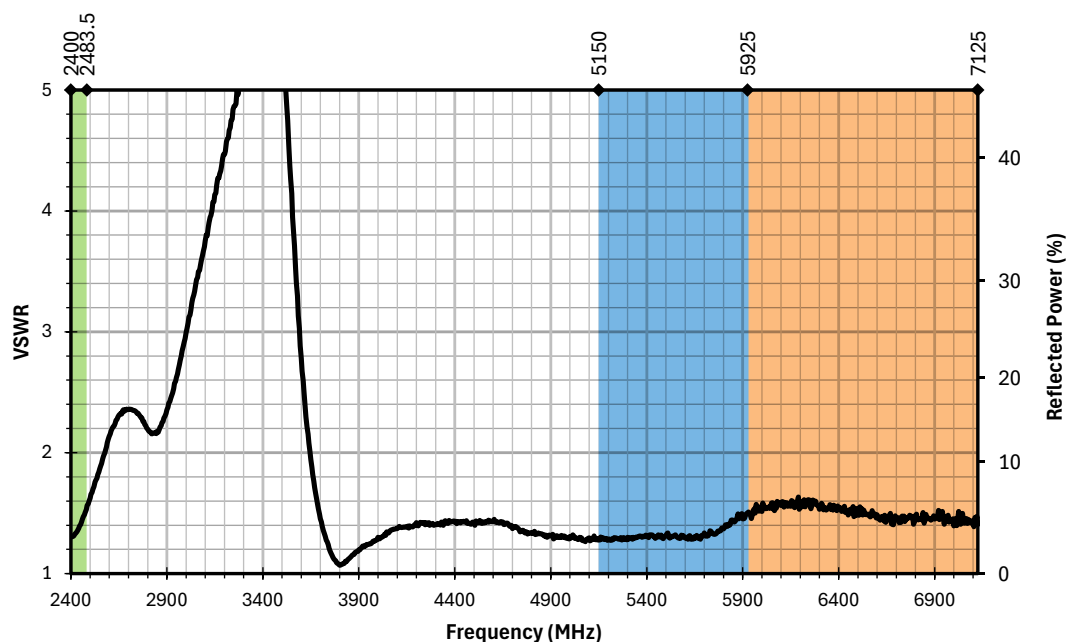


Figure 4. AC16000 Antenna VSWR at edge of Ground Plane

Return Loss

Return loss (Figure 5) 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.

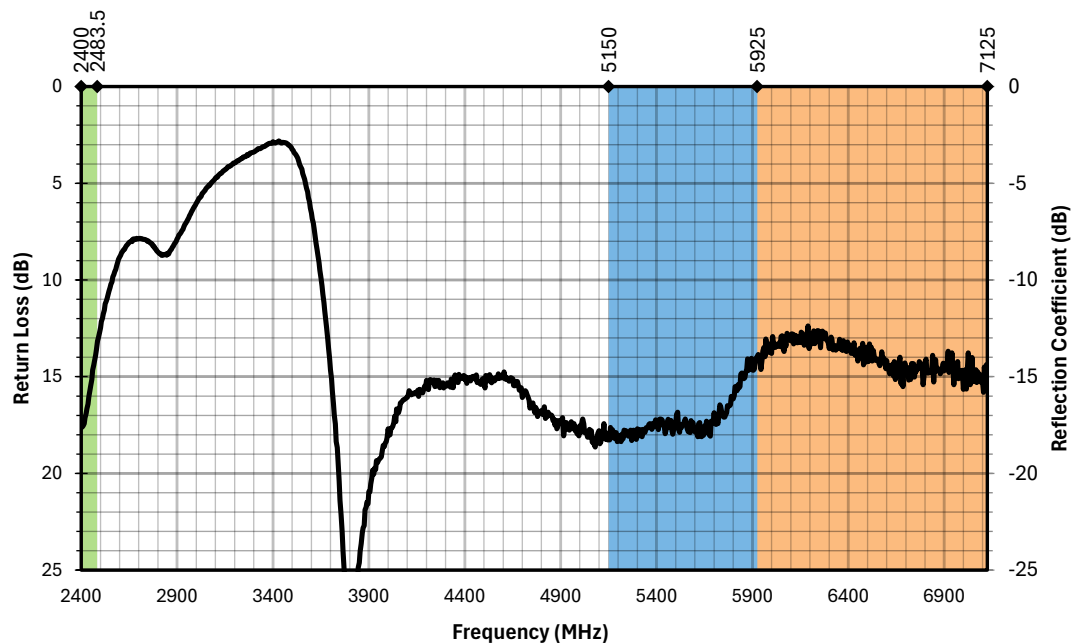


Figure 5. AC16000 Antenna Return Loss at edge of Ground Plane

Peak Gain

Peak gain (Figure 6) 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.

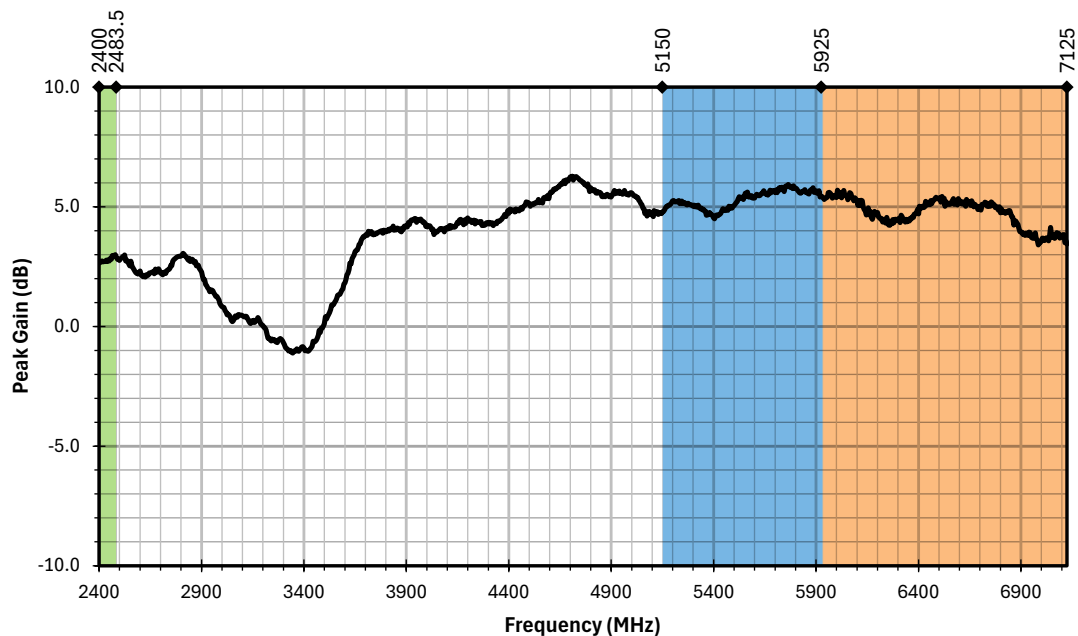


Figure 6. AC16000 Antenna Peak Gain at edge of Ground Plane

Average Gain

Average gain (Figure 7) is the average of all antenna gain in 3-dimensional space at each frequency, providing an indication of overall performance without expressing antenna directionality.

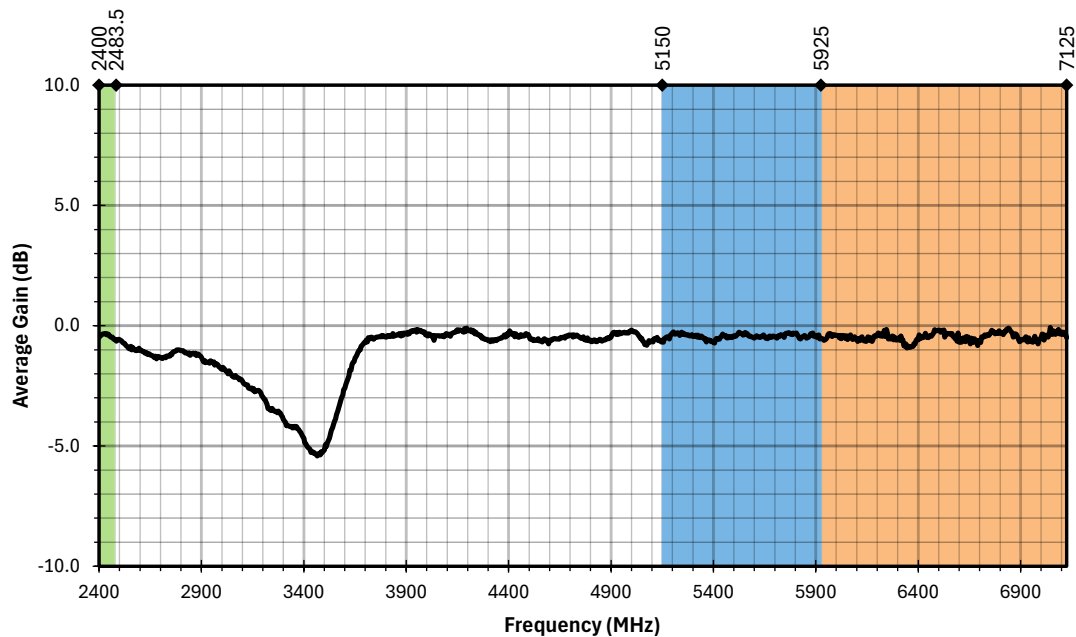


Figure 7. AC16000 Antenna Average Gain at edge of Ground Plane

Efficiency

Efficiency (Figure 8) 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.

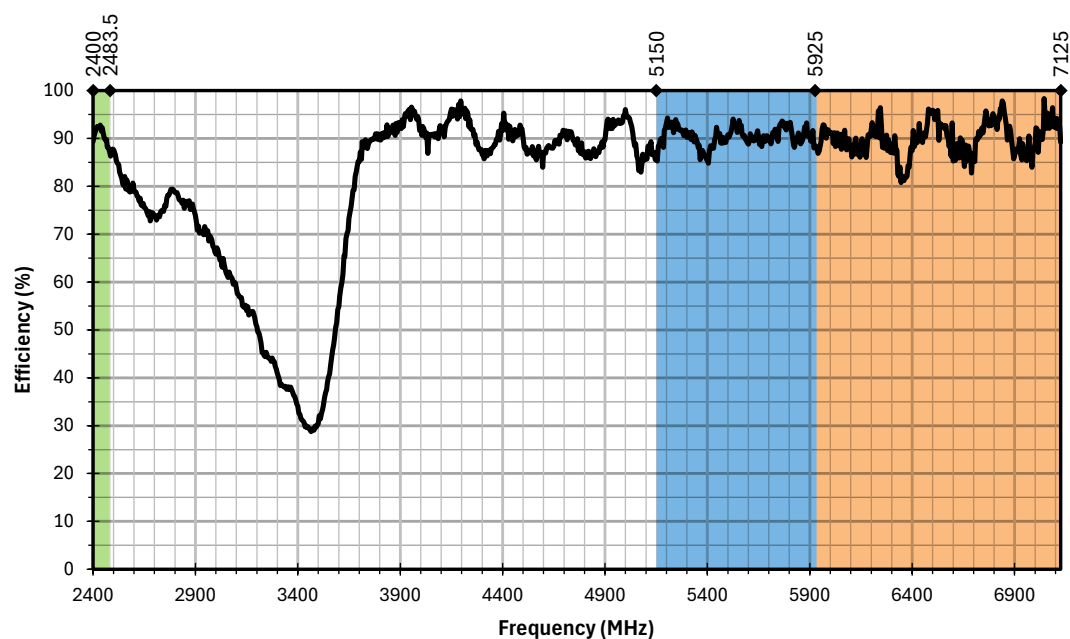
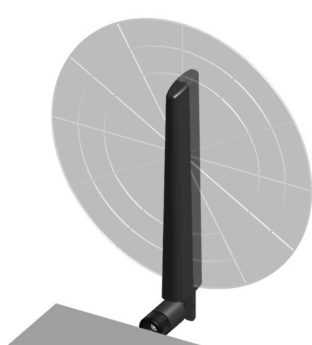


Figure 8. AC16000 Antenna Efficiency at edge of Ground Plane

Radiation Patterns - Edge of Ground Plane

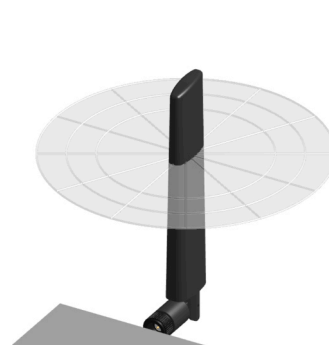
Radiation patterns provide information about the directional performance of the antenna by plotting gain in three orthogonal planes at the high-, low- and center-frequencies of an antenna frequency band. Antenna radiation patterns (Figure 9) are shown using polar plots covering 360 degrees with the plane 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

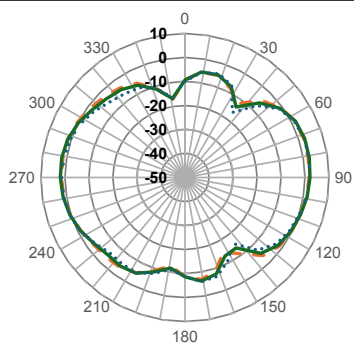


YZ-Plane Gain

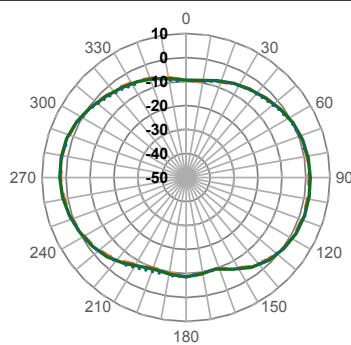


XY-Plane Gain

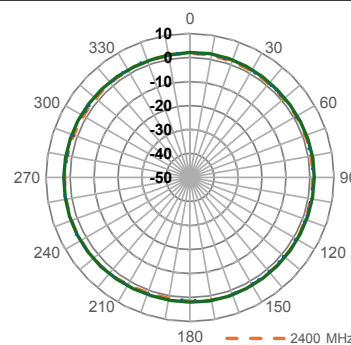
2400 MHz to 2485 MHz (2445 MHz)



XZ-Plane Gain



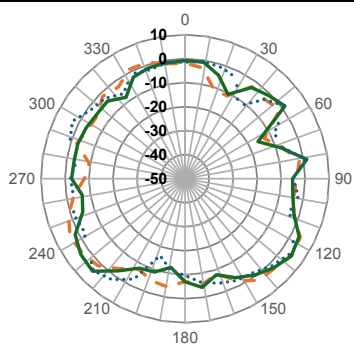
YZ-Plane Gain



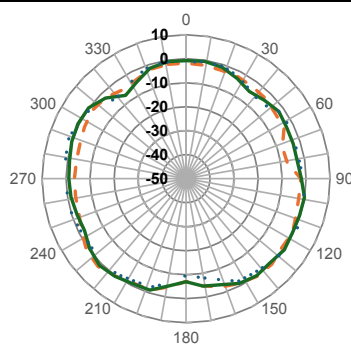
XY-Plane Gain

— 2400 MHz
— 2445 MHz
... 2485 MHz

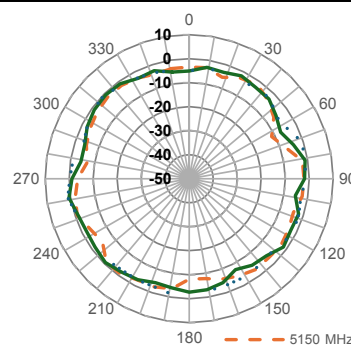
5150 MHz to 5895 MHz (5520 MHz)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

— 5150 MHz
— 5500 MHz
... 5850 MHz

Radiation Patterns

5925 MHz to 7125 MHz (6525 MHz)

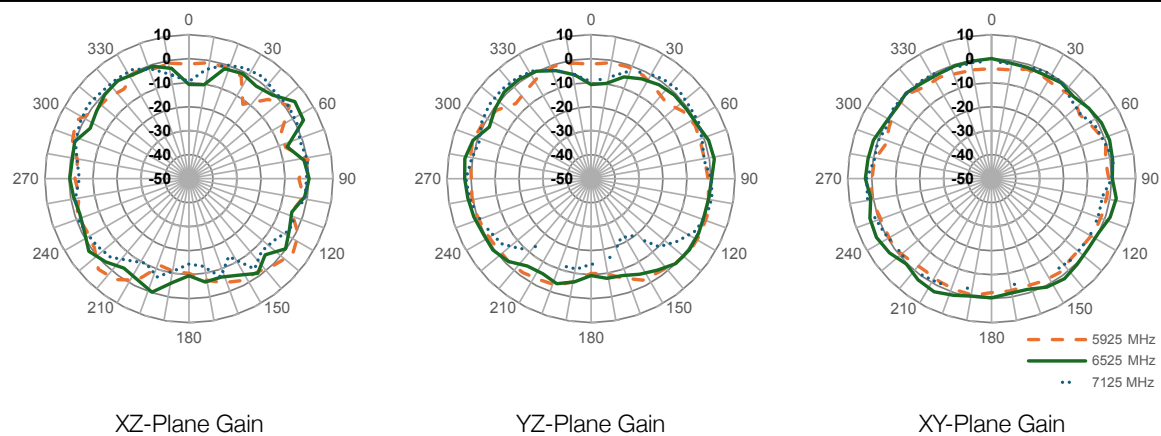


Figure 9. Radiation Patterns for the AC16000 Antenna

Straight, No Ground Plane

The charts on the following pages represent data taken with the antenna in free space as shown in Figure 10.



Figure 10. AC16000 Antenna in Free Space

VSWR

Figure 11 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.

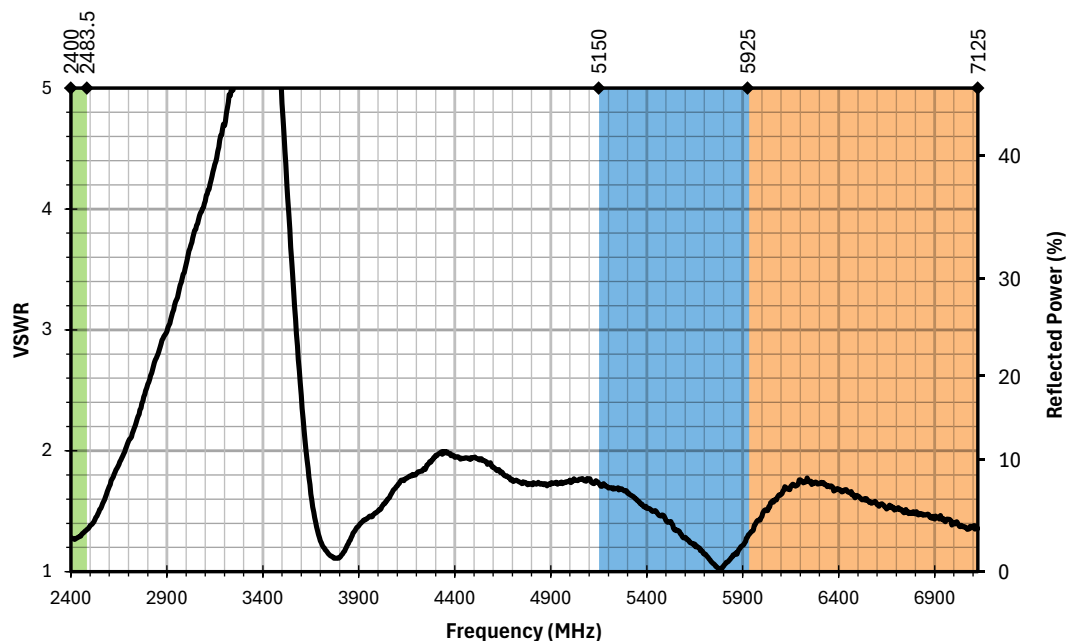


Figure 11. AC16000 Antenna VSWR, Free Space

Return Loss

Return loss (Figure 12) 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.

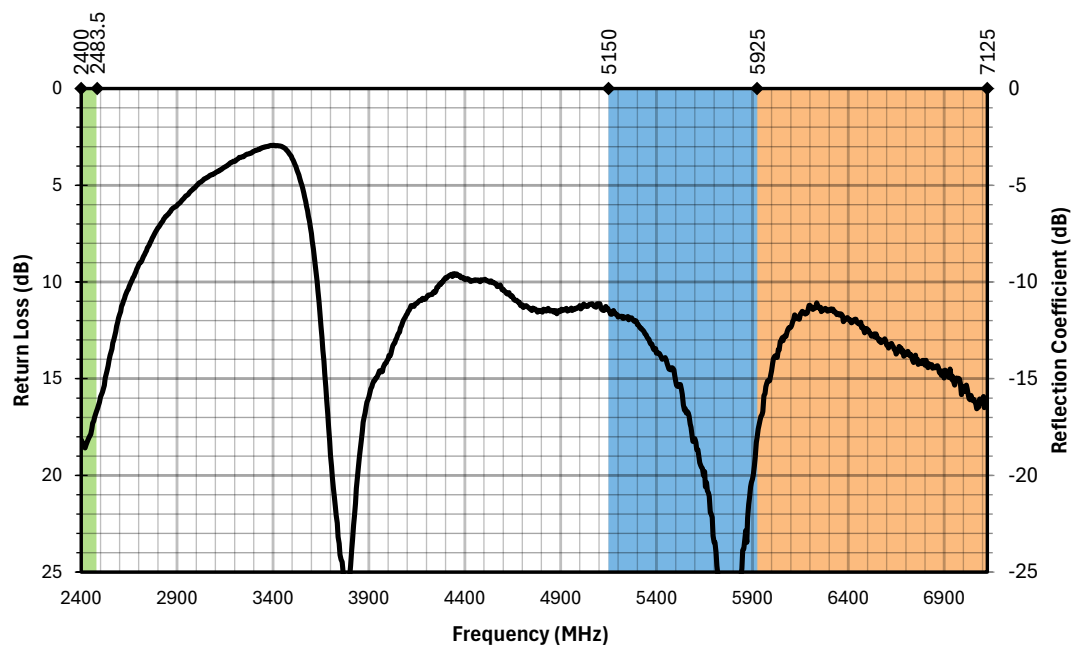


Figure 12. AC16000 Antenna Return Loss, Free Space

Peak Gain

Peak gain (Figure 13) 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.

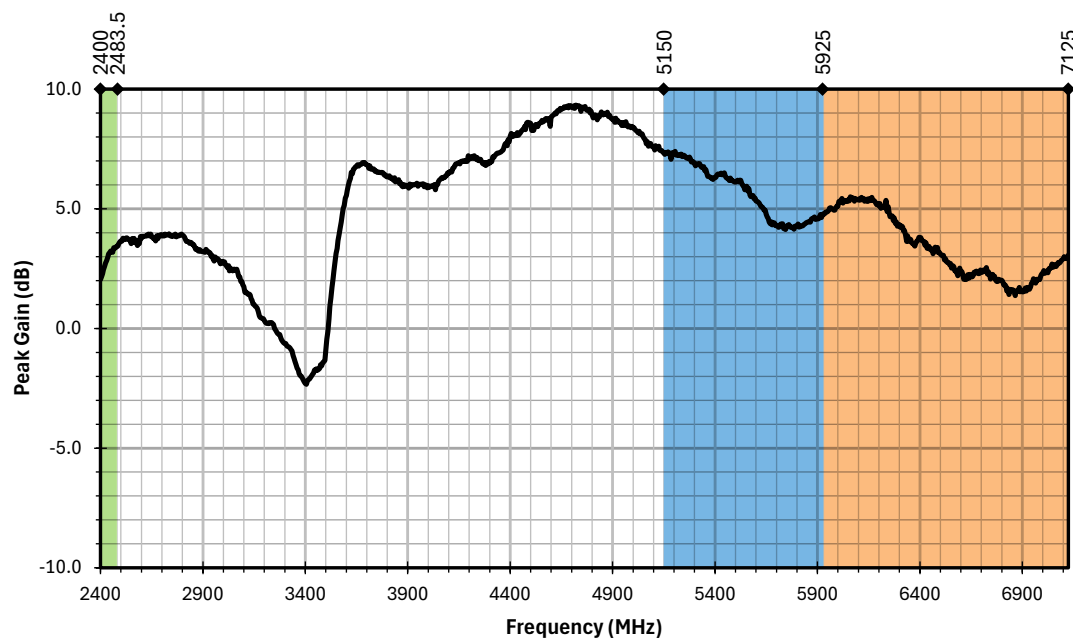


Figure 13. AC16000 Antenna Peak Gain, Free Space

Average Gain

Average gain (Figure 14) is the average of all antenna gain in 3-dimensional space at each frequency, providing an indication of overall performance without expressing antenna directionality.

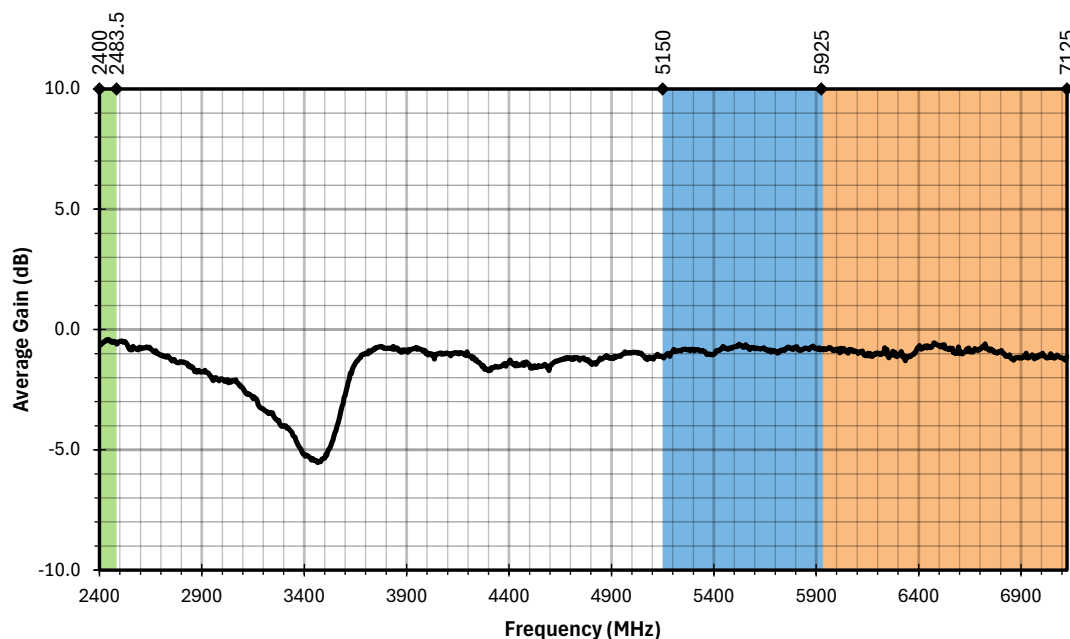


Figure 14. AC16000 Antenna Average Gain, Free Space

Efficiency

Efficiency (Figure 15) 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.

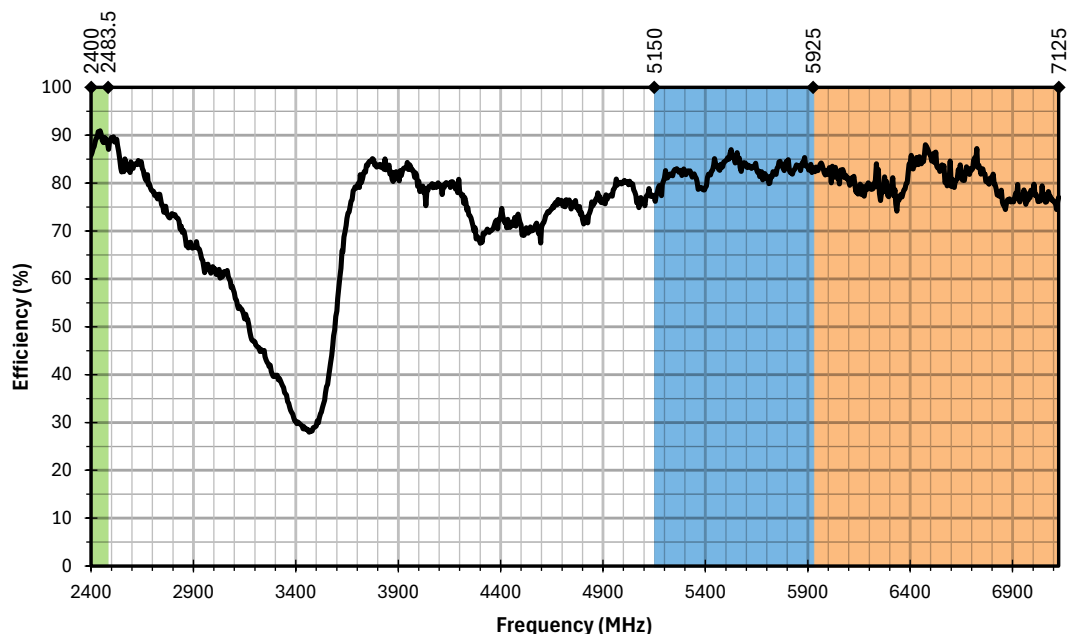


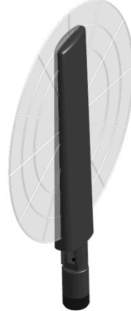
Figure 15. AC16000 Antenna Efficiency, Free Space

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 16) 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

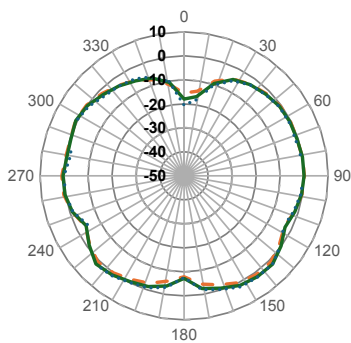


YZ-Plane Gain

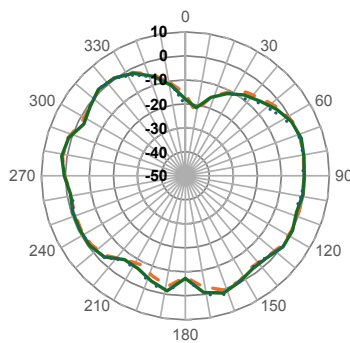


XY-Plane Gain

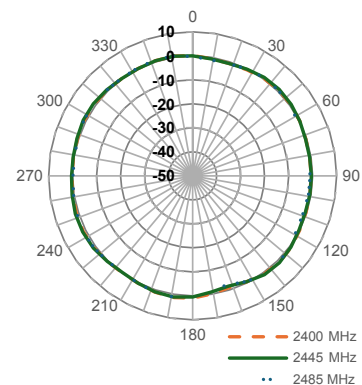
2400 MHz to 2500 MHz (2450 MHz)



XZ-Plane Gain

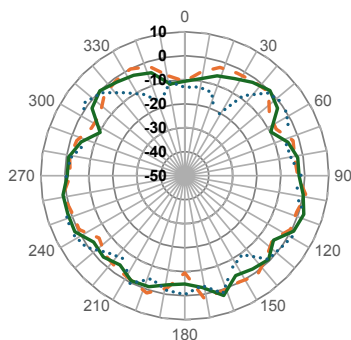


YZ-Plane Gain

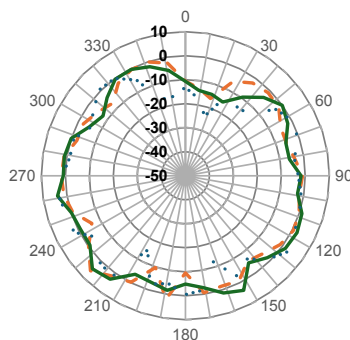


XY-Plane Gain

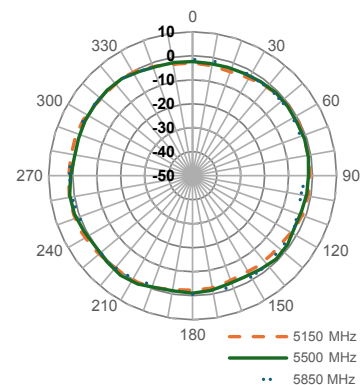
5150 MHz to 5895 MHz (5520 MHz)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

Radiation Patterns

5925 MHz to 7125 MHz (6525 MHz)

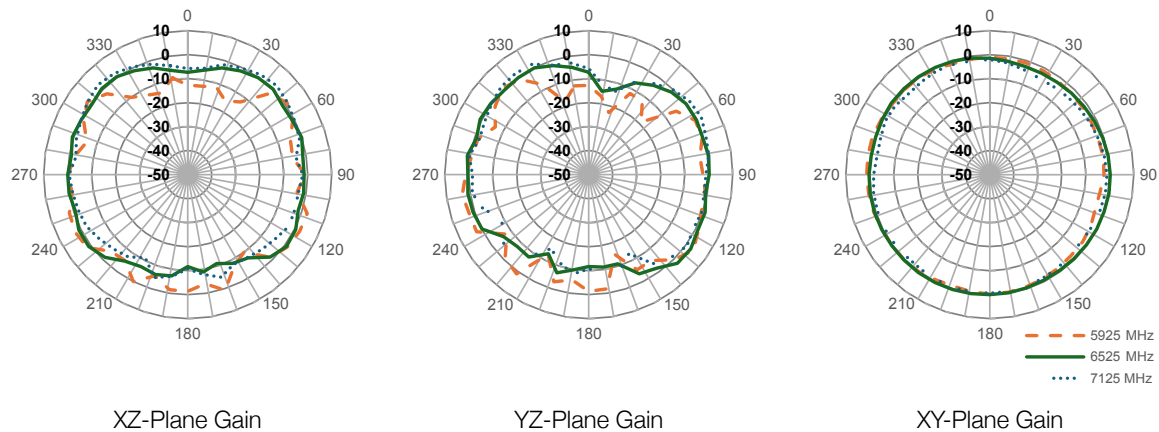


Figure 16. Radiation Patterns for the AC16000 Antenna, in Free Space

Packaging Information

The AC16000 antenna is individually packaged in a polyethylene bag as shown in Figure 17 and then packaged in a larger polyethylene bag in quantities of 5 each. These bags are placed in (honeycomb) pockets in a carton of 2 layers totalling 500 pieces. Carton dimensions are 335 mm x 295 mm x 360 mm (13.2 in x 11.6 in x 14.2 in).

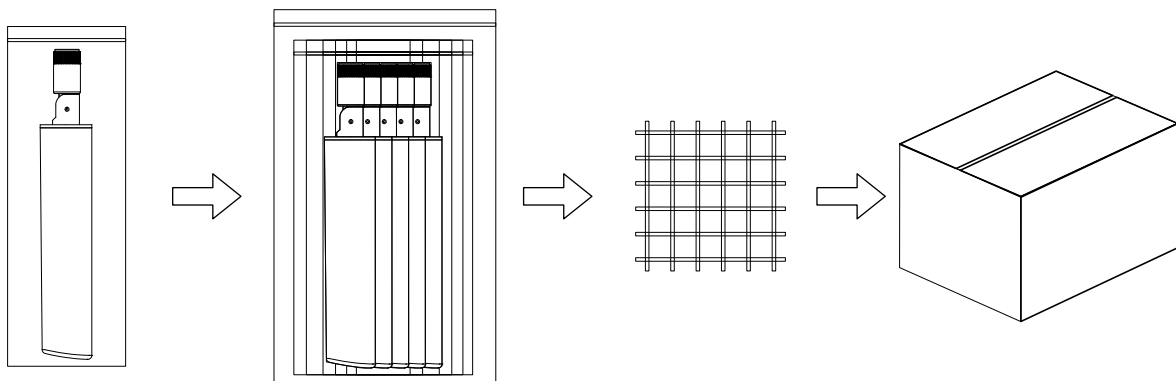


Figure 17. Packaging Details for the AC16000 Antenna

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