ANT-LTE-WS-SMA

Dipole Blade LTE Antenna

The ANT-LTE-WS-SMA is a compact dipole, blade- style antenna for LTE and cellular IoT (LTE-M, NB- IoT) applications.

The ANT-LTE-WS-SMA antenna is made of rugged ABS plastic. The antenna's hinged, rotating, design allows for the antenna to be positioned for optimum performance and reduces the potential for damage from impact compared to a fixed whip design. The antenna attaches using an SMA plug (male pin) connector.

FEATURES

- Covers all common 4G/3G/2G LTE bands
- Performance at 1710 MHz to 2200 MHz
  - VSWR: ≤ 2.0
  - Peak Gain: 5.9 dBi
  - Efficiency: 75%
- Performance at 791 MHz to 960 MHz
  - VSWR: ≤ 1.7
  - Peak Gain: 3.4 dBi
  - Efficiency: 63%
- Rugged ABS construction
- Hinged design with detents for straight, 45 degree and 90 degree positioning
- SMA plug (male pin) connector

APPLICATIONS

- Worldwide 5G/4G/3G/2G
- Worldwide LTE, UMTS and GSM
- Cellular IoT: LTE-M (Cat-M1) and NB-IoT
- Internet of Things (IoT) devices
- Smart Home networking
- Sensing and remote monitoring

ORDERING INFORMATION

Part Number	Description
ANT-LTE-WS-SMA	Blade-style LTE antenna with SMA plug (male pin) connector

Available from Linx Technologies and select distributors and representatives.

TABLE 1. ELECTRICAL SPECIFICATIONS

Bands	Frequency Range	VSWR (max.)	Peak Gain (dBi)	Avg. Gain (dBi)	Efficiency (%)
12, 13, 14, 17, 26, 28, 29, 44, 67, 68, 85, n83	698 MHz to 803 MHz	1.6	4.1	-2.2	63
5, 18, 19, 20, 26, 27, n82, n89	791 MHz to 960 MHz	1.7	3.4	-3.1	63
24	1553 MHz to 1609 MHz	3.3	5.0	-1.7	69
1, 2, 3, 4, 25, 66	1710 MHz to 2200 MHz	2.0	5.9	-1.8	75
30, 40	2300 MHz to 2400 MHz	2.1	3.1	-1.6	71
7, 41	2496 MHz to 2690 MHz	2.2	4.1	-1.6	72
Impedance	50 Ω				
Wavelength	1/2-wave				
Electrical Type	Dipole				
Radiation	Omnidirectional				
Polarization	Linear				
Max Power	10 W				

Electrical specifications and plots measured with the antenna in a straight orientation.

TABLE 2. MECHANICAL SPECIFICATIONS

Parameter	Value
Connection	SMA plug (male pin)
Antenna Color	Black
Operating Temp. Range	-20 °C to +65 °C
Weight	1.4 g (0.05 oz)
Dimensions	136.3 mm x 21.8 mm x 10.0 mm (5.36 in x 0.86 in x 0.39 in)

PRODUCT DIMENSIONS

Figure 1 provides dimensions of the ANT-LTE-WS-SMA antenna. The antenna whip can be tilted 90 degrees, and has 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.

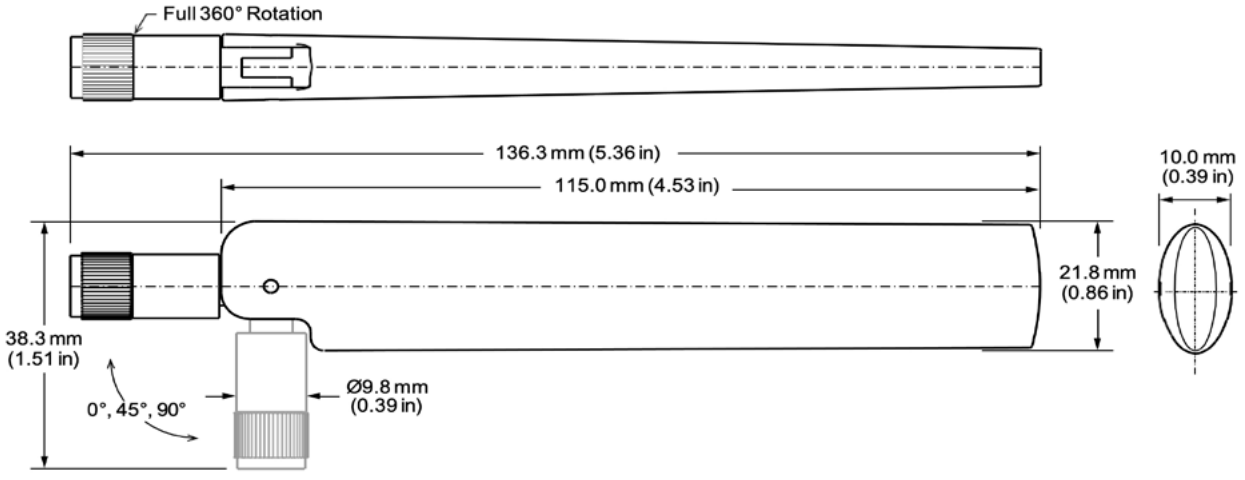


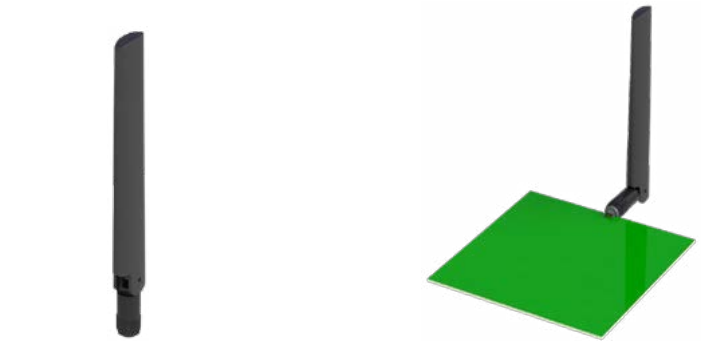
Figure 1. ANT-LTE-WS-SMA Antenna Dimensions

PACKAGING INFORMATION

The ANT-LTE-WS-SMA antenna is individually sealed in a clear plastic bag. 600 bags per carton, 400 mm x 300 mm x 230 mm (15.7 in x 11.8 in x 9.1 in), total weight 10.1 kgs (22.3 lb). Distribution channels may offer alternative packaging options.

ANTENNA ORIENTATION

The ANT-LTE-WS-SMA antenna is characterized in two antenna orientations as shown in Figure 2. The antenna straight orientation characterizes use of an antenna attached to an enclosure-mounted connector which is connected by cable to a printed circuit board. Although the antenna is a dipole not requiring a ground plane for function, characterization with an adjacent ground plane (102 mm x 102 mm) provides insight into antenna performance when attached directly to a printed circuit board mounted connector. These two orientations represent the most common end-product use cases.



Straight, without ground plane | Edge of ground plane, bent 90 degrees

Figure 2. ANT-LTE-WS-SMA Antenna Test Orientation

STRAIGHT, NO GROUND PLANE

The charts on the following pages represent data taken with the antenna oriented straight, as shown in Figure 3.

Figure 3. ANT-LTE-WS-SMA Straight, No Ground Plane (Straight)

VSWR

Figure 4 provides the voltage standing wave ratio (VSWR) across the antenna bandwidth. VSWR describes the power reflected from the antenna back to the radio. 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 gauge of the percentage of transmitter power reflected back from the antenna.

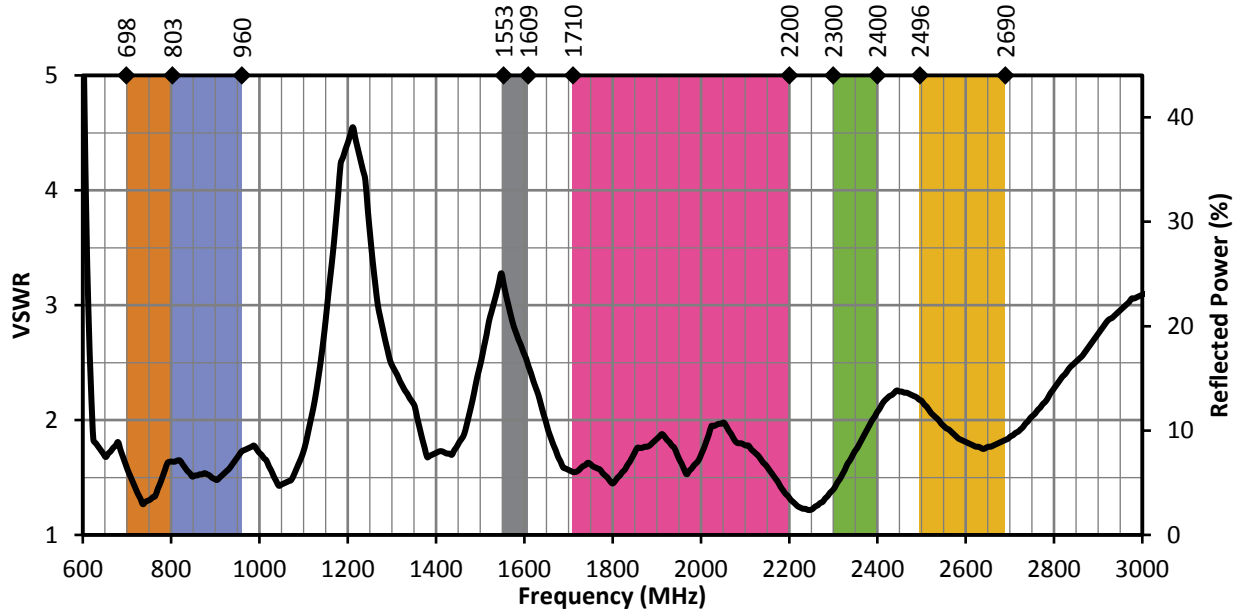


Figure 4. ANT-LTE-WS-SMA Antenna VSWR, Straight

RETURN LOSS

Return loss (Figure 5), represents the loss in power at the antenna due to reflected signals. Like VSWR, a lower return loss value indicates better antenna performance at a given frequency.

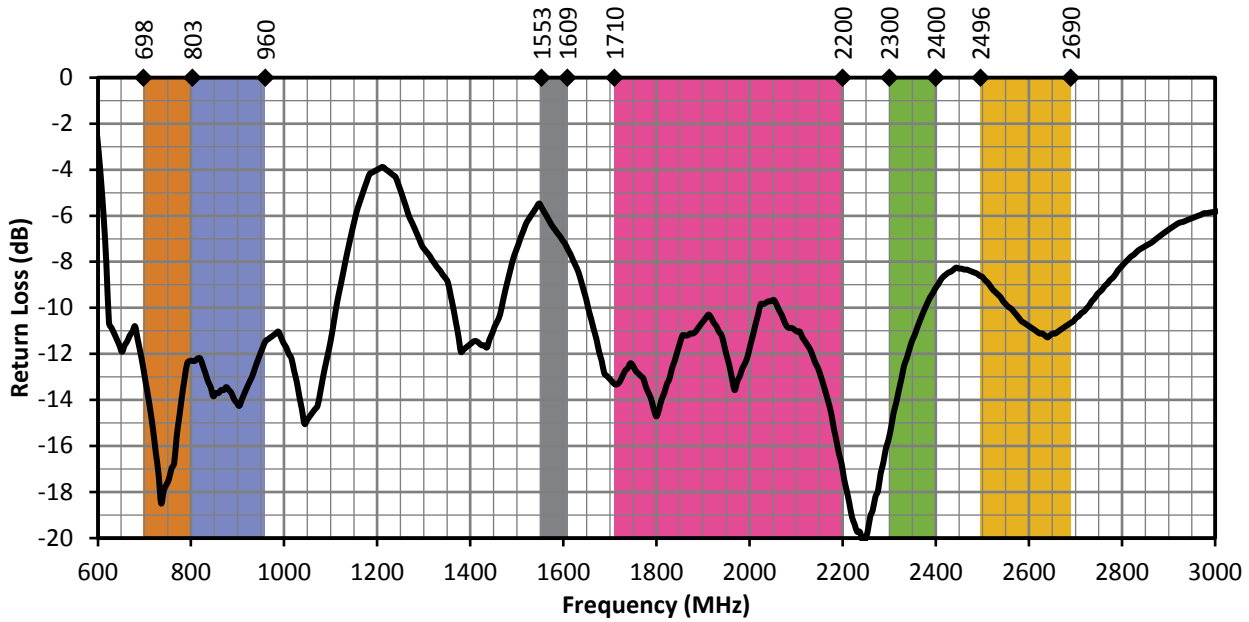


Figure 5. ANT-LTE-WS-SMA Antenna Return Loss, Straight

PEAK GAIN

The peak gain across the antenna bandwidth is shown in Figure 6. Peak gain represents the maximum antenna input power concentration across 3-dimensional space, and therefore peak performance at a given frequency, but does not consider any directionality in the gain pattern.

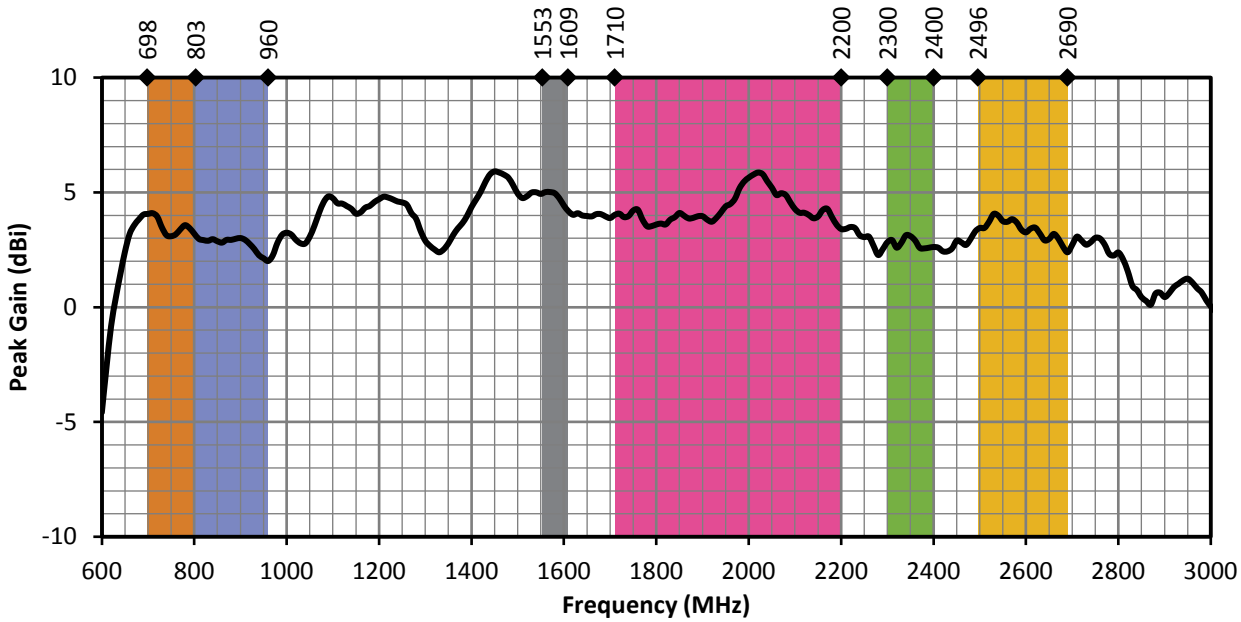


Figure 6. ANT-LTE-WS-SMA Antenna Peak Gain, Straight

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.

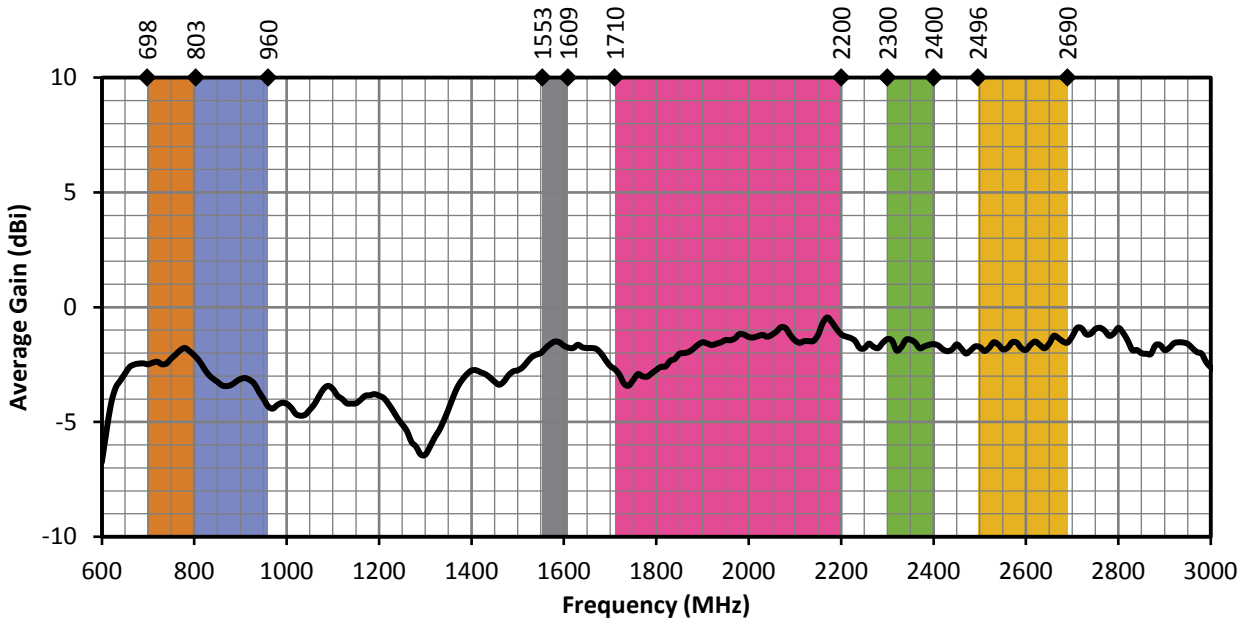


Figure 7. ANT-LTE-WS-SMA Antenna Average Gain, Straight

RADIATION EFFICIENCY

Radiation efficiency (Figure 8), shows 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.

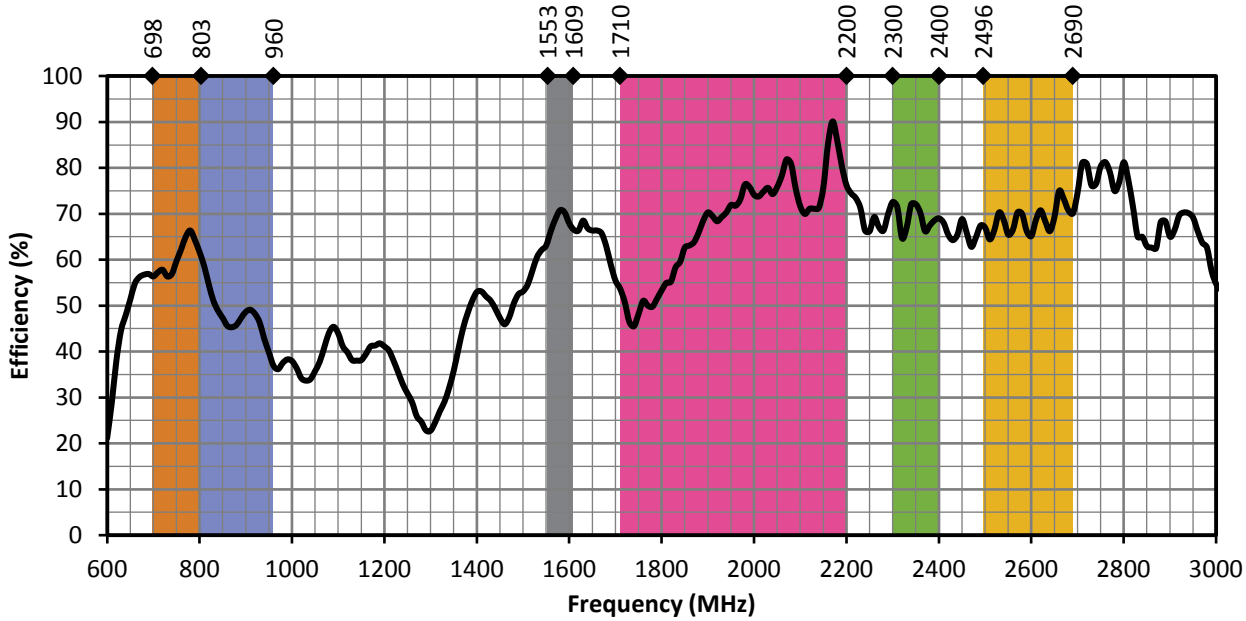


Figure 8. ANT-LTE-WS-SMA Antenna Efficiency, Straight

RADIATION PATTERNS - STRAIGHT

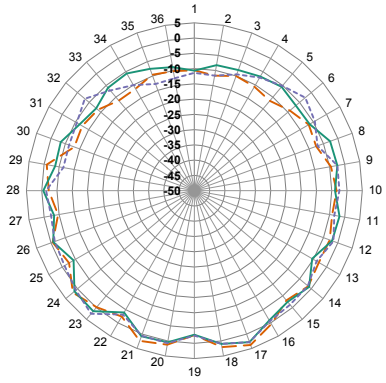
Radiation patterns provide information about the directionality and 3-dimensional gain performance of the antenna by plotting gain at specific frequencies in three orthogonal planes. Antenna radiation patterns for a straight orientation are shown in Figure 9 using polar plots covering 360 degrees. The antenna graphic at the top of the page provides reference to the plane of the column of plots below it. Note: when viewed with typical PDF viewing software, zooming into radiation patterns is possible to reveal fine detail.

XZ-Plane Gain

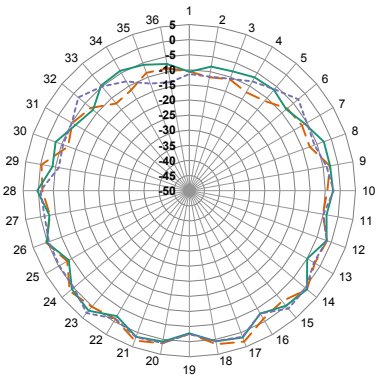
YZ-Plane Gain

XY-Plane Gain

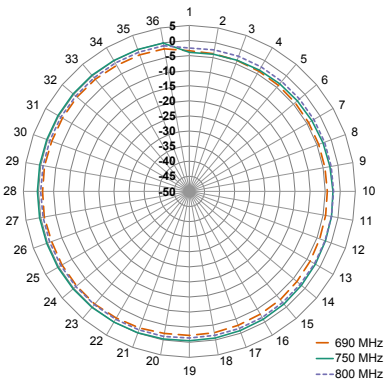
698 MHz TO 803 MHz (750 MHz)



XZ-Plane Gain

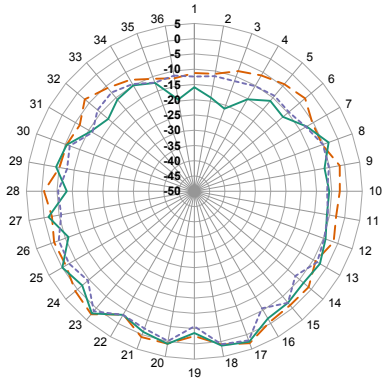


YZ-Plane Gain

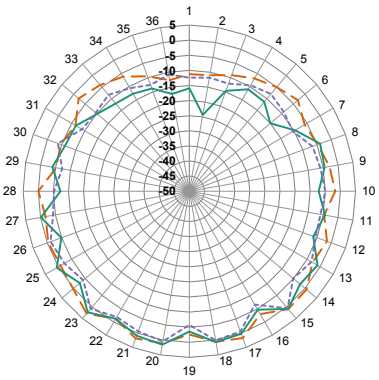


XY-Plane Gain

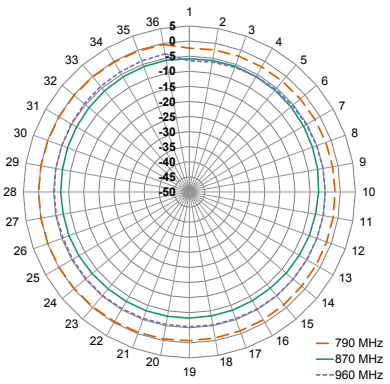
790 MHz TO 960 MHz (870 MHz)



XZ-Plane Gain



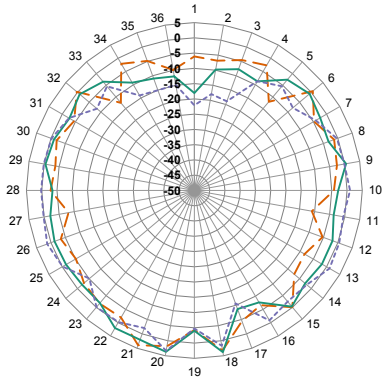
YZ-Plane Gain



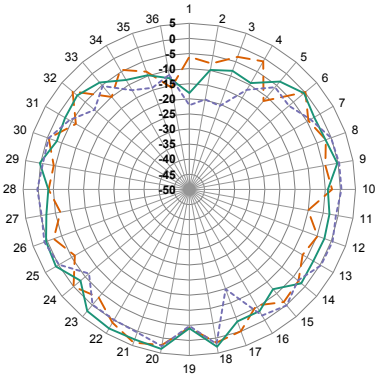
XY-Plane Gain

RADIATION PATTERNS - STRAIGHT

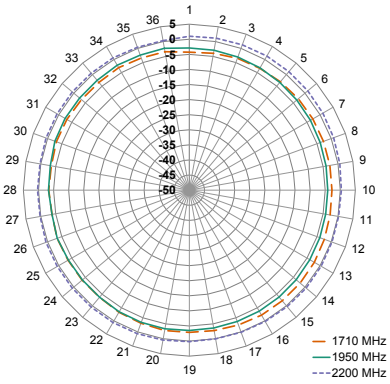
1710 MHz to 2200 MHz (1950 MHz)



XZ-Plane Gain

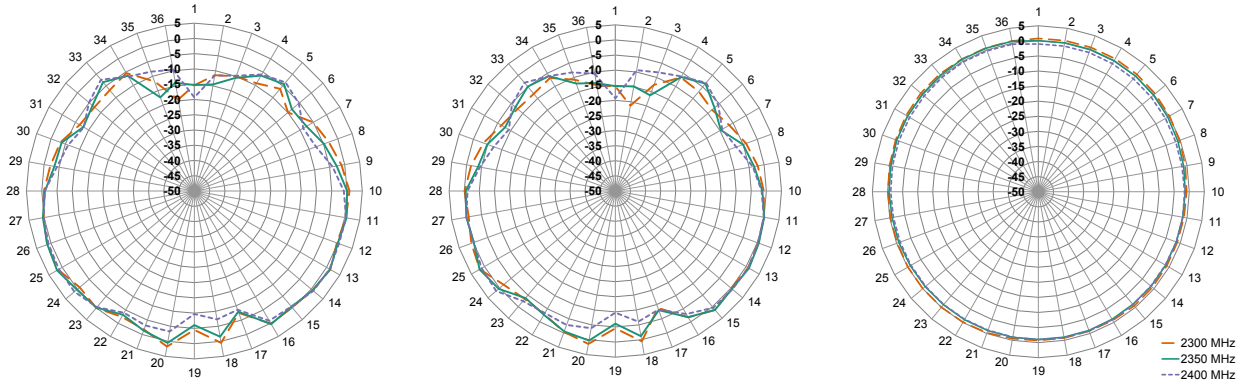


YZ-Plane Gain



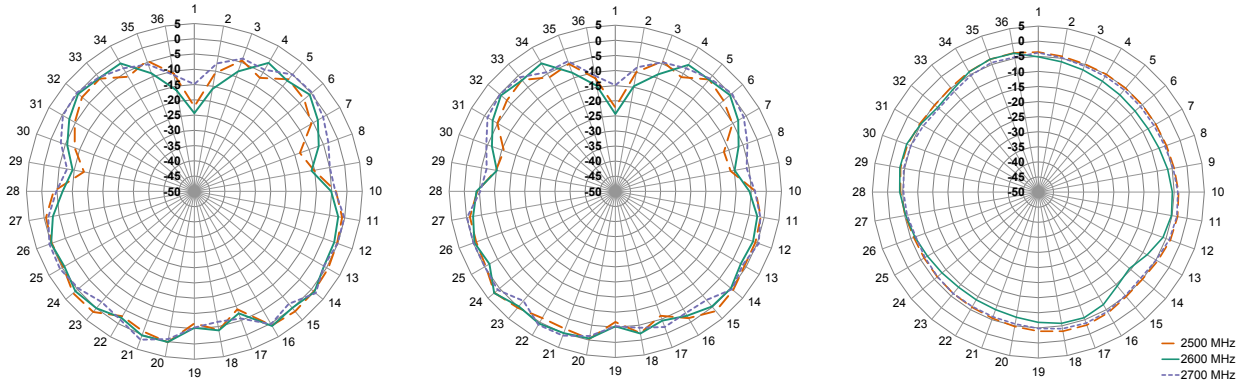
XY-Plane Gain

2300 MHz TO 2400 MHz (2350 MHz)



XZ-Plane Gain YZ-Plane Gain XY-Plane Gain

2496 MHz TO 2690 MHz (2600 MHz)



XZ-Plane Gain YZ-Plane Gain XY-Plane Gain

Figure 9. Radiation Patterns for ANT-LTE-WS-SMA, Edge-Bent

EDGE OF GROUND PLANE, BENT 90 DEGREES

The charts on the following pages represent data taken with the antenna oriented at the edge of the ground plane, bent 90 degrees (Edge-Bent), as shown in Figure 10.

Figure 10. ANT-LTE-WS-SMA on Edge of Ground Plane, Bent 90 Degrees (Edge-Bent)

VSWR

Figure 11 provides the voltage standing wave ratio (VSWR) across the antenna bandwidth. VSWR describes the power reflected from the antenna back to the radio. 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 gauge of the percentage of transmitter power reflected back from the antenna.

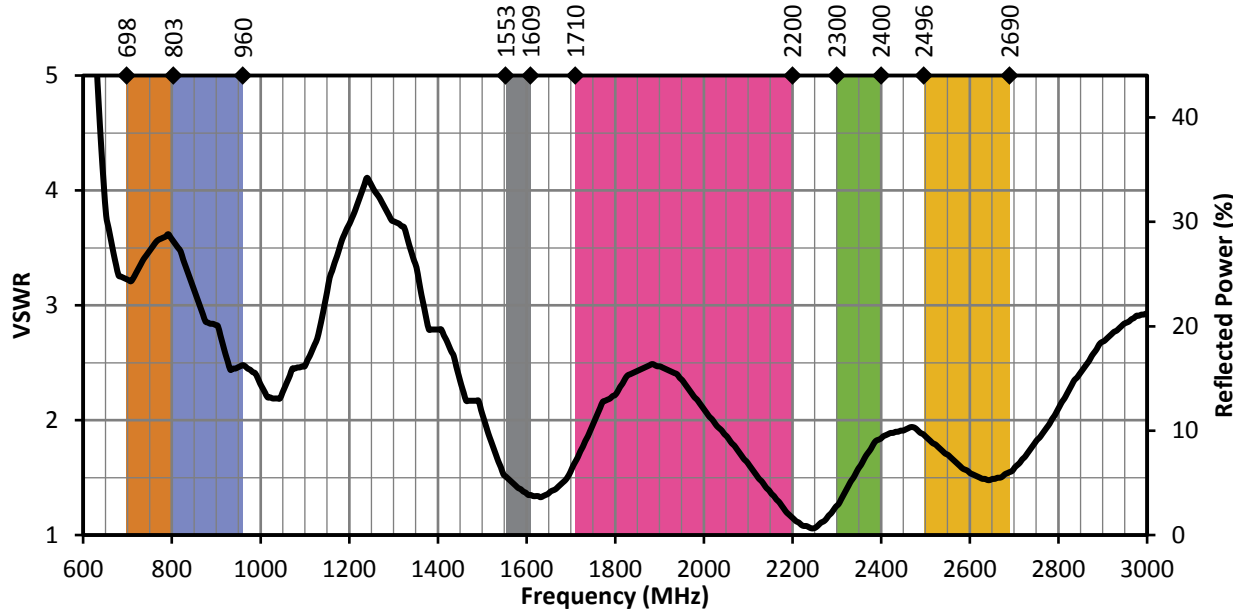


Figure 11. ANT-LTE-WS-SMA Antenna VSWR, Edge-Bent

RETURN LOSS

Return loss (Figure 12), represents the loss in power at the antenna due to reflected signals. Like VSWR, a lower return loss value indicates better antenna performance at a given frequency.

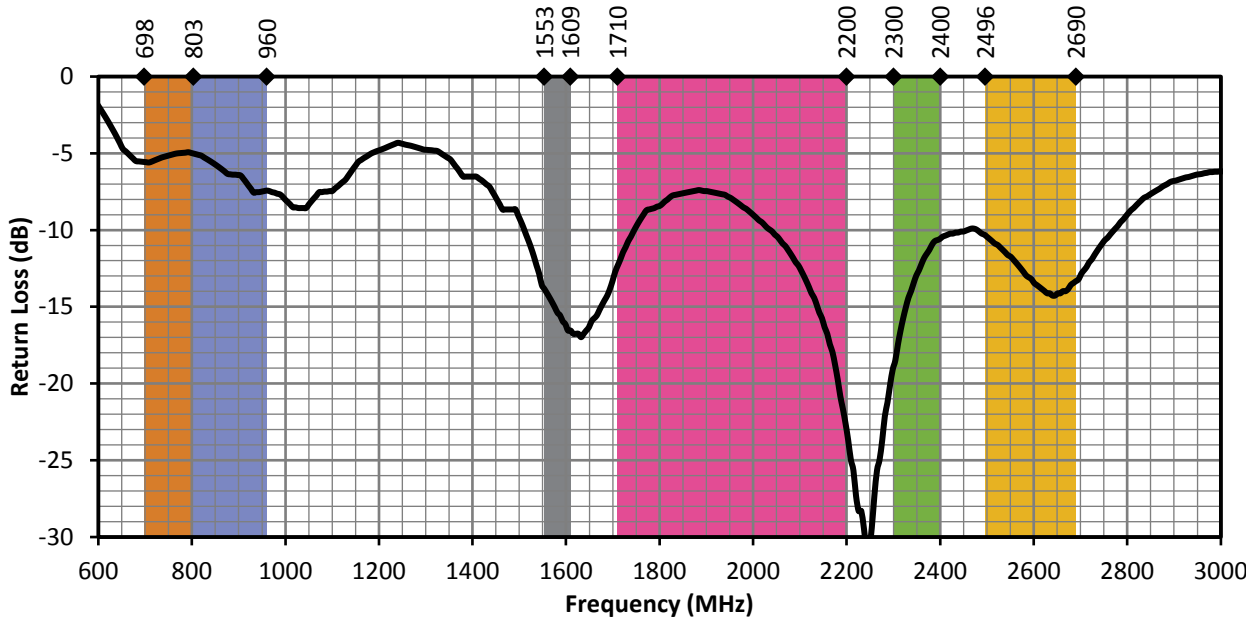


Figure 7. ANT-LTE-WS-SMA Antenna Average Gain, Straight

PEAK GAIN

The peak gain across the antenna bandwidth is shown in Figure 13. Peak gain represents the maximum antenna input power concentration across 3-dimensional space, and therefore peak performance at a given frequency, but does not consider any directionality in the gain pattern.

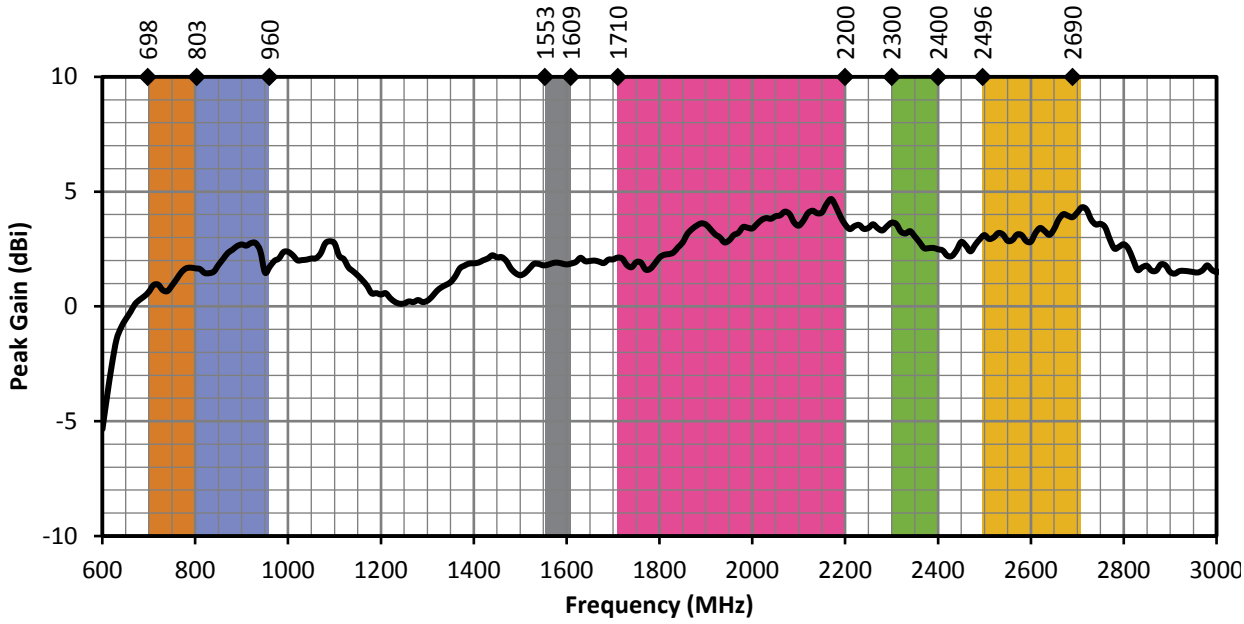


Figure 13. ANT-LTE-WS-SMA Antenna Peak Gain, Edge-Bent

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.

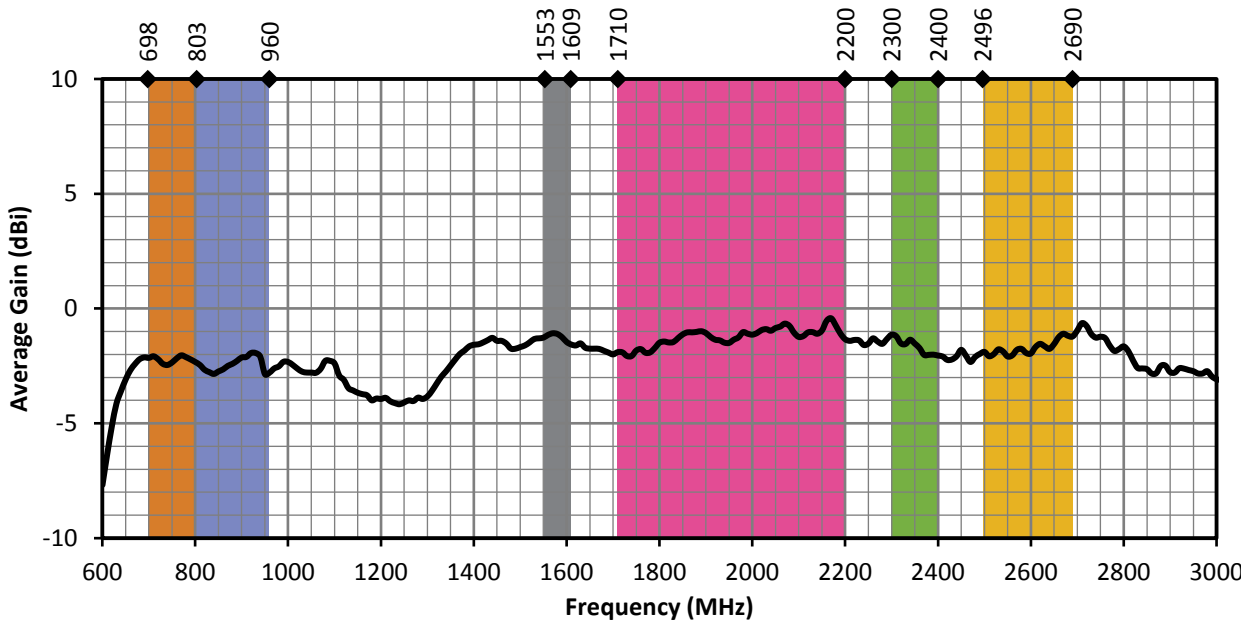


Figure 7. ANT-LTE-WS-SMA Antenna Average Gain, Straight

RADIATION EFFICIENCY

Radiation efficiency (Figure 15), shows 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.

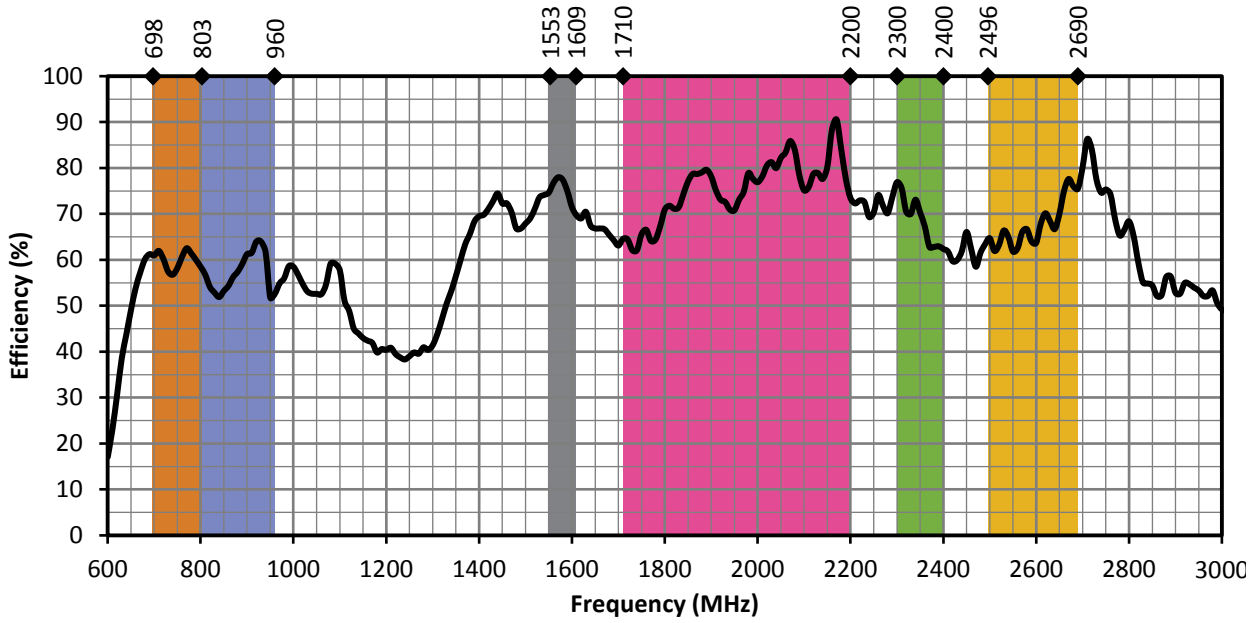


Figure 15. ANT-LTE-WS-SMA Antenna Efficiency, Edge-Bent

RADIATION PATTERNS - EDGE-BENT

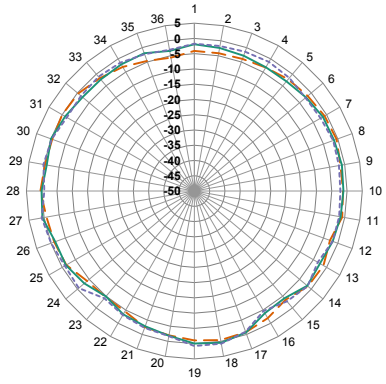
Radiation patterns provide information about the directionality and 3-dimensional gain performance of the antenna by plotting gain at specific frequencies in three orthogonal planes. Antenna radiation patterns for an Edge-Bent orientation are shown in Figure 16 using polar plots covering 360 degrees. The antenna graphic at the top of the page provides reference to the plane of the column of plots below it. Note: when viewed with typical PDF viewing software, zooming into radiation patterns is possible to reveal fine detail.

XZ-Plane Gain

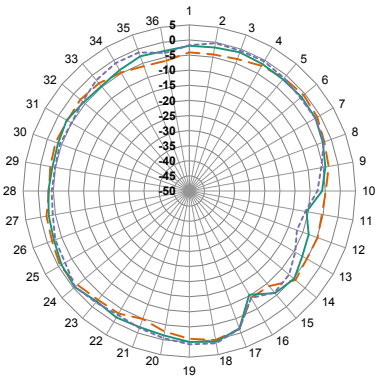
YZ-Plane Gain

XY-Plane Gain

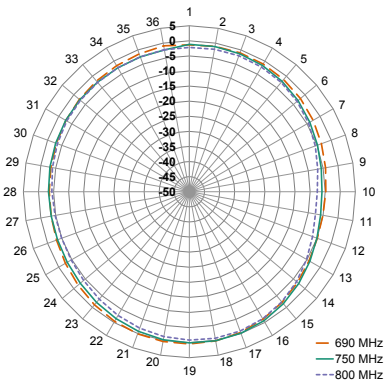
698 MHz TO 803 MHz (750 MHz)



XZ-Plane Gain

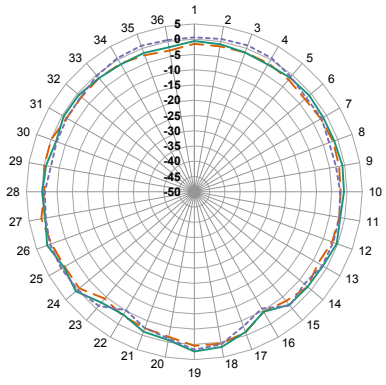


YZ-Plane Gain

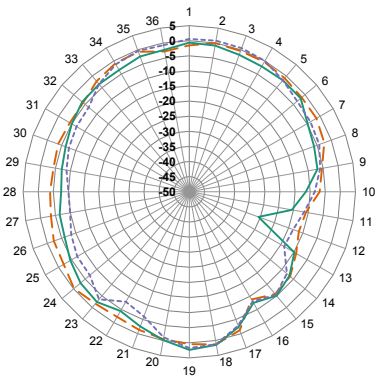


XY-Plane Gain

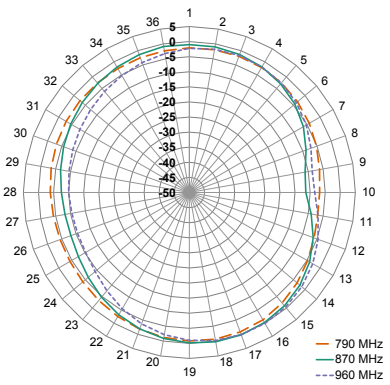
791 MHz TO 960 MHz (870 MHz)



XZ-Plane Gain



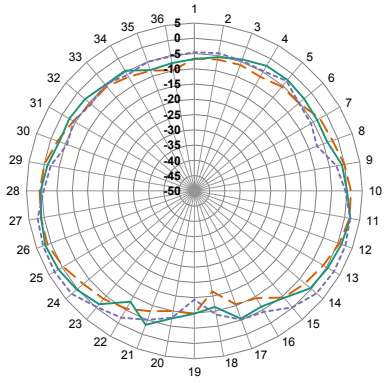
YZ-Plane Gain



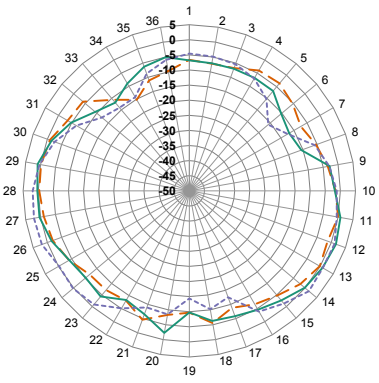
XY-Plane Gain

Radiation Patterns - Edge-Bent

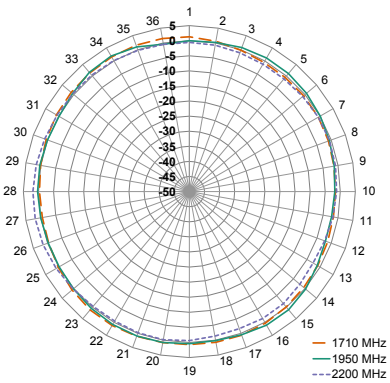
1710 MHz TO 2200 MHz (1950 MHz)



XZ-Plane Gain

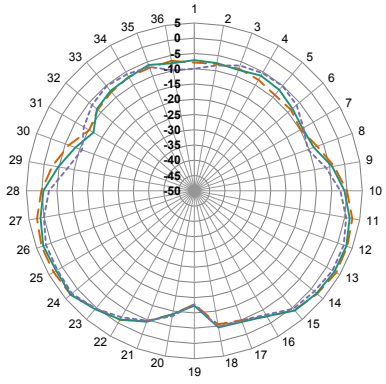


YZ-Plane Gain

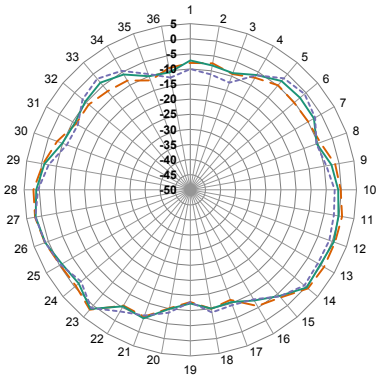


XY-Plane Gain

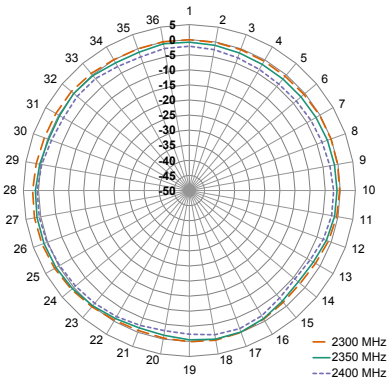
2300 MHz TO 2400 MHz (2350 MHz)



XZ-Plane Gain

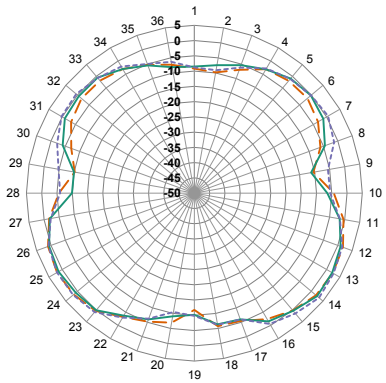


YZ-Plane Gain

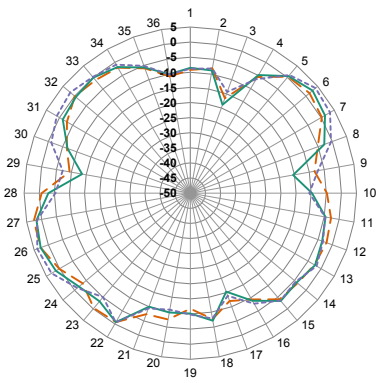


XY-Plane Gain

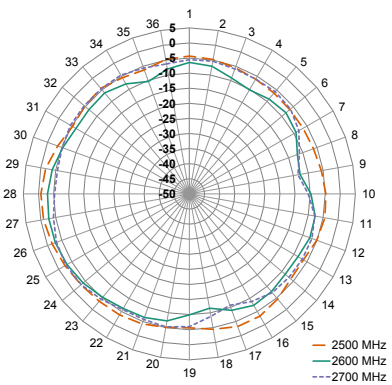
2496 MHz TO 2690 MHz (2600 MHz)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

TE TECHNICAL SUPPORT CENTER

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