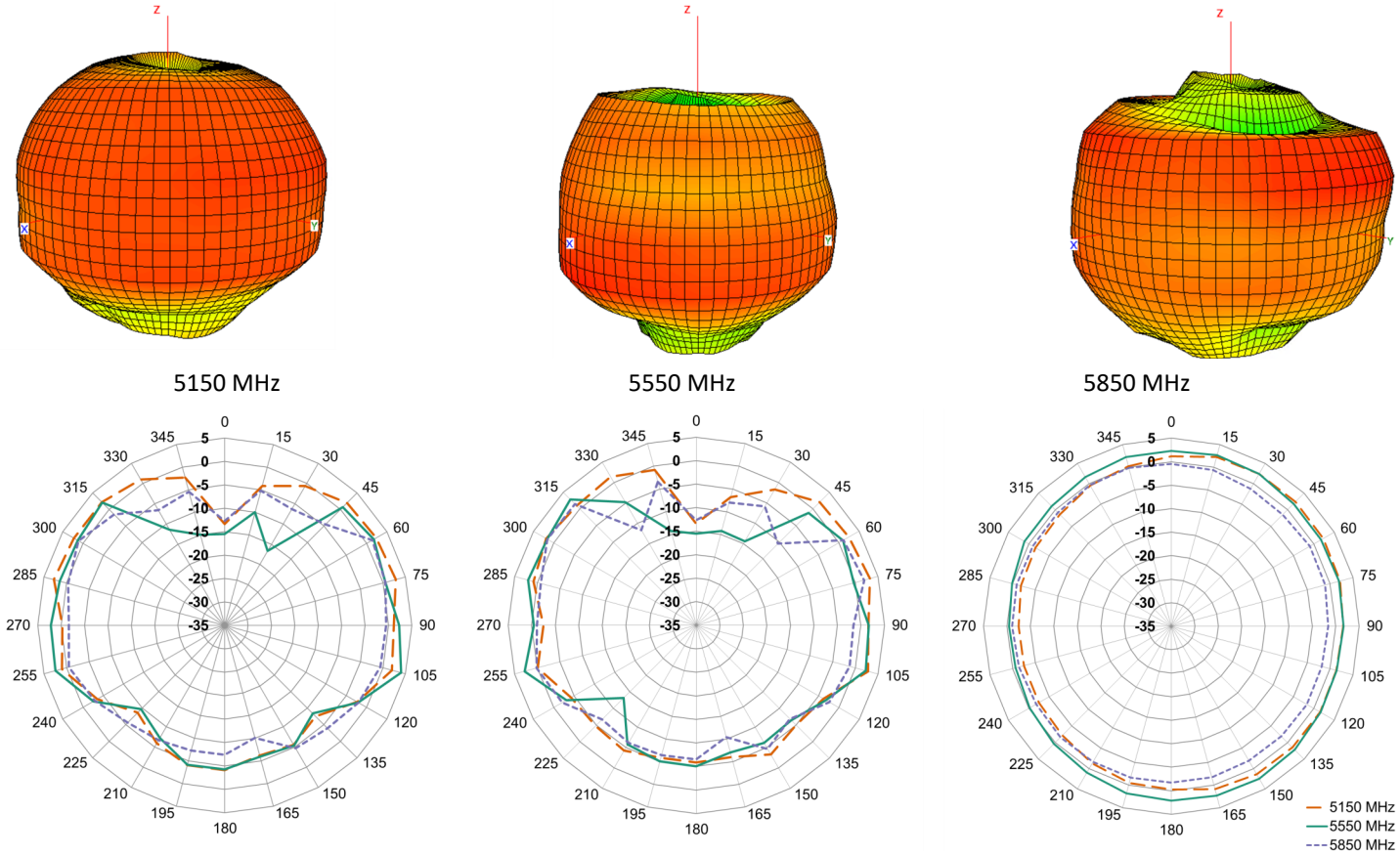
5150 MHz to 5850 MHz (5550 MHz)



5925 MHz to 7125 MHz (6525 MHz)

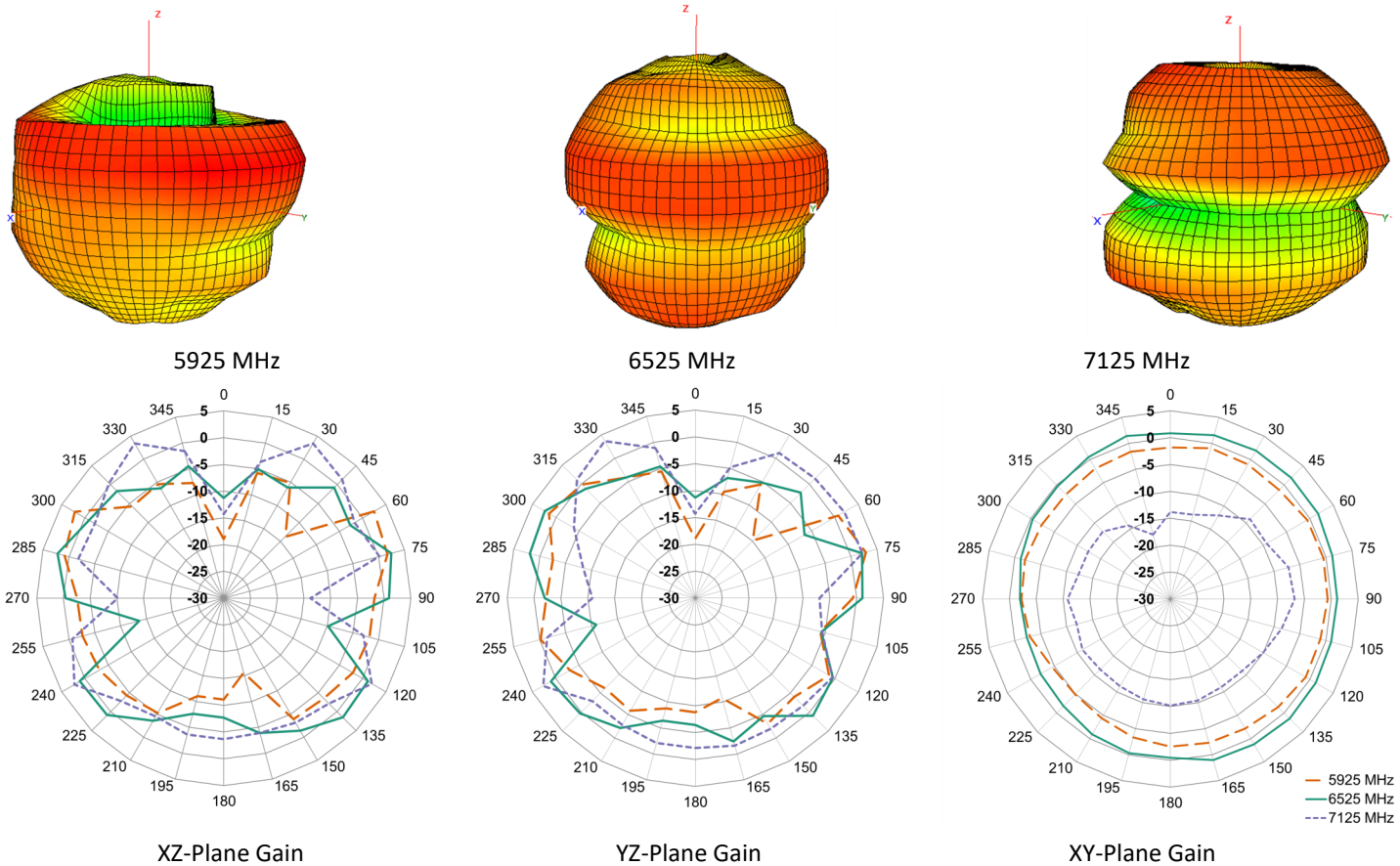


Figure 10-1. Antenna Radiation Patterns, Straight without ground plane

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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 11**.

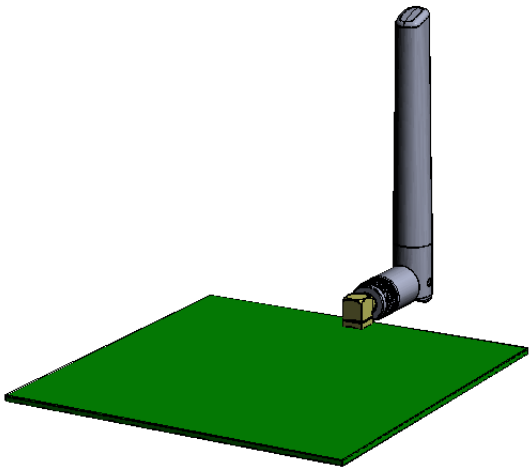

Figure 11. On edge of ground plane, Bent 90 Degrees

VSWR

Figure 12 provides the voltage standing wave ratio (VSWR) across the antenna bandwidth. VSWR is a function of the reflection coefficient, which 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.

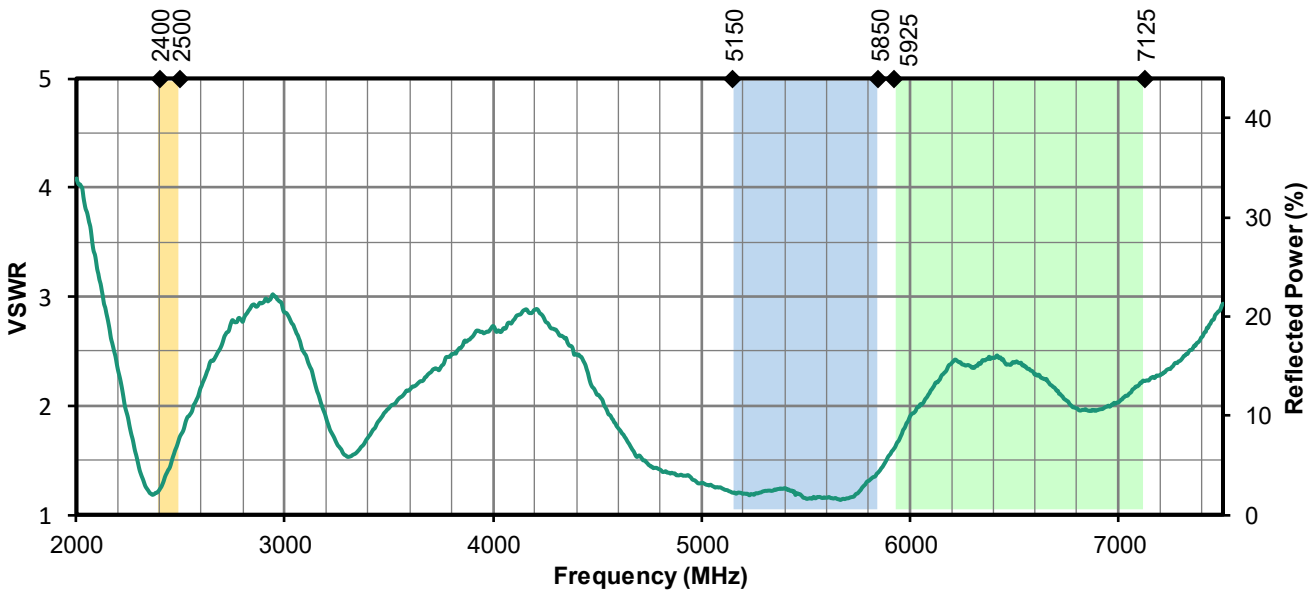

Figure 12. Antenna VSWR, Edge Bent 90 Degrees

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Return Loss

Return loss (**Figure 13**), 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.

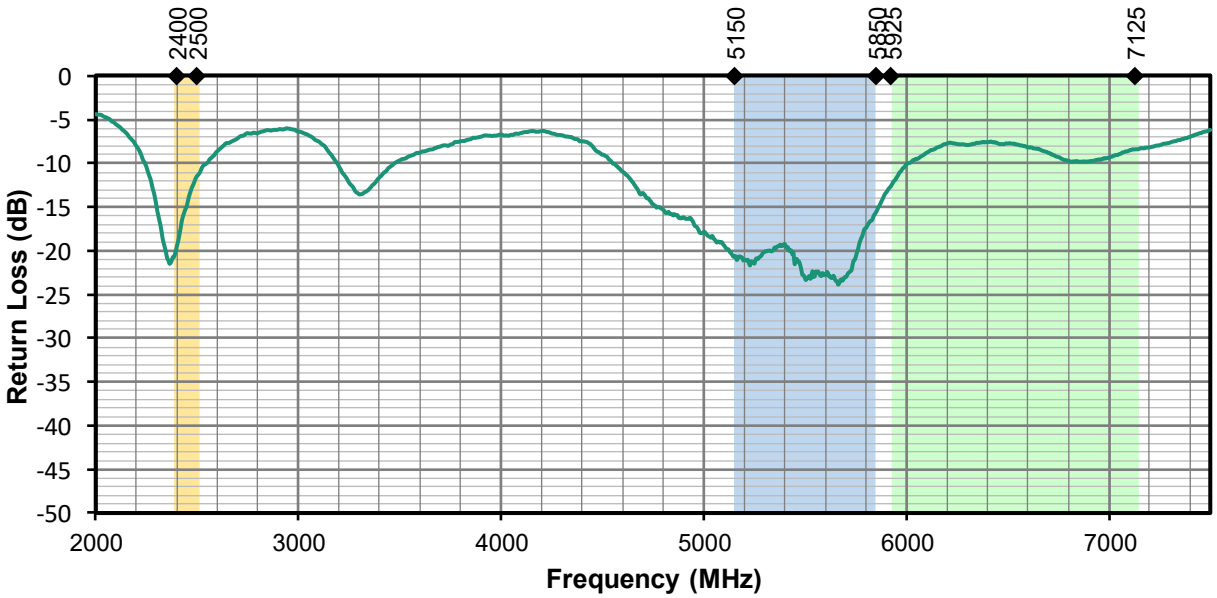

Figure 13. Antenna Return Loss, Edge Bent 90 Degrees

Peak Gain

The peak gain across the antenna bandwidth is shown in **Figure 14**. 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.

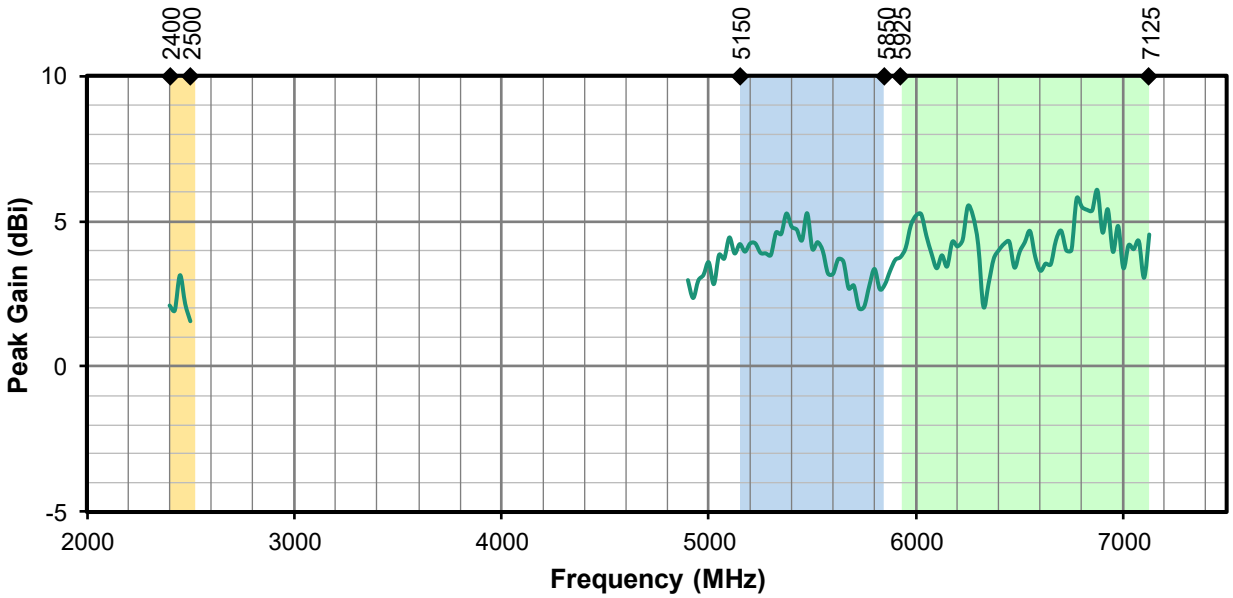

Figure 14. Antenna Peak Gain, Edge Bent 90 Degrees

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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.

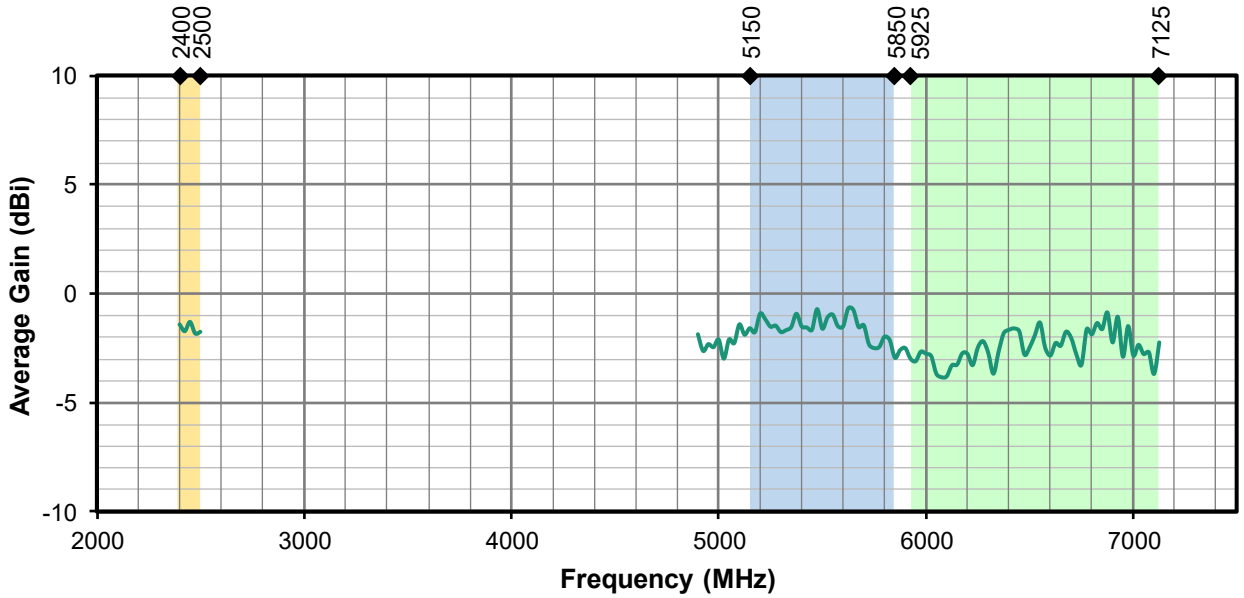


Figure 15. Antenna Average Gain, Edge Bent 90 Degrees

Radiation Efficiency

Radiation efficiency (**Figure 16**), shows the ratio of power radiated by the antenna relative to the power supplied to the antenna, expressed as a percentage, where a higher percentage indicates better performance at a given frequency. An ideal antenna has 100% efficiency. But in really world, usually an external antenna radiates only 50~60% of power supplied to it.

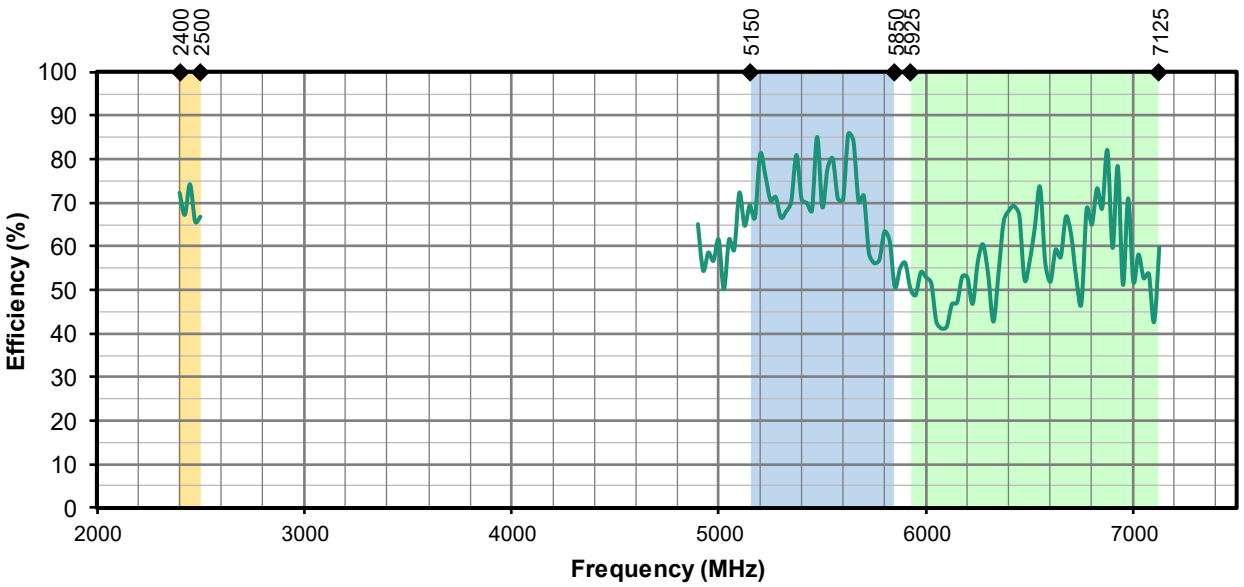
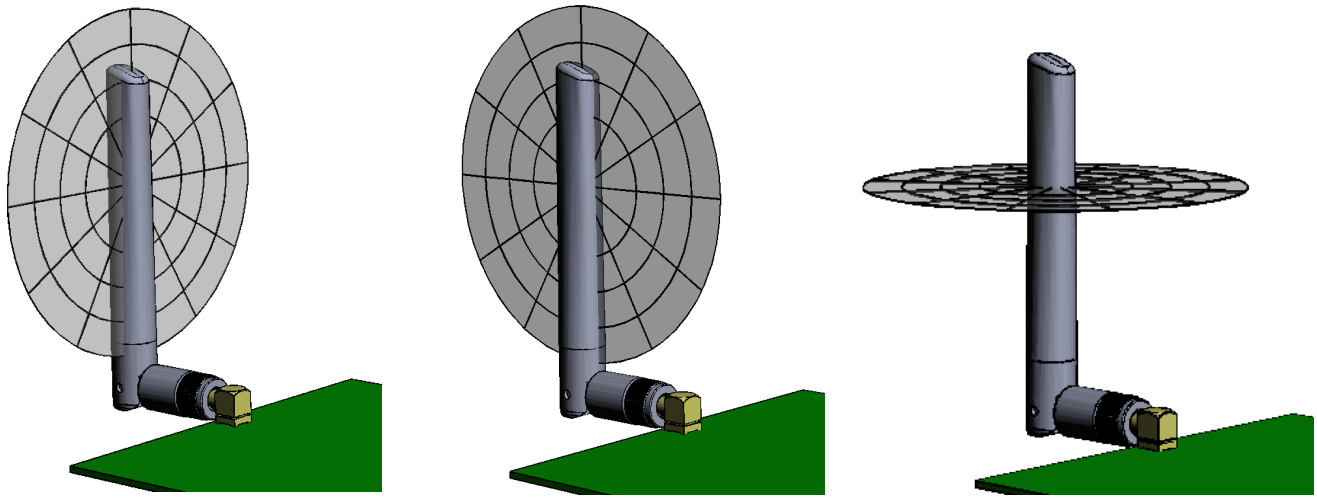


Figure 16. Antenna Efficiency, Edge Bent 90 Degrees

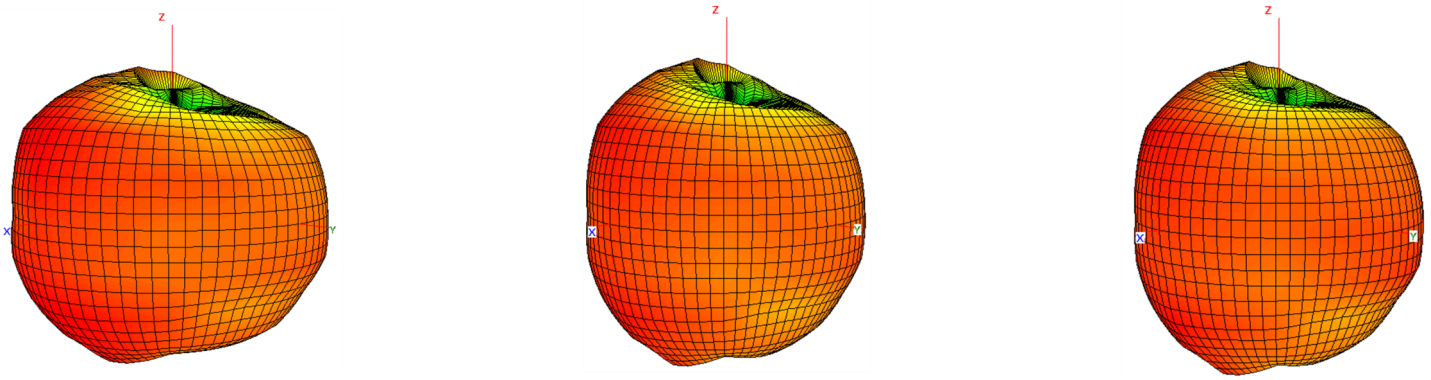
Radiation Patterns

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 17** 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.

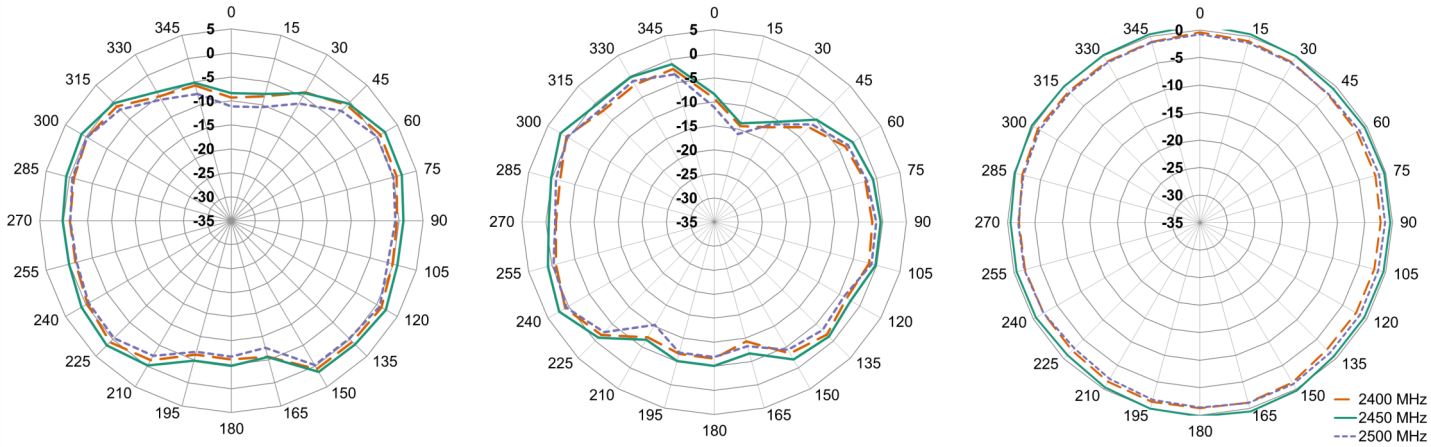


XZ-Plane Gain YZ-Plane Gain XY-Plane Gain

2400 MHz to 2500 MHz (2450 MHz)



2400 MHz 2450 MHz 2500 MHz



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

Figure 17. Antenna Radiation Patterns, Edge Bent 90 Degrees

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