

Figure 9: Antenna Performance in Proximity of Copper (Left), Laminate (Middle) and Laminate under Antenna (Right)

The actual TINY™ module evaluation board layout that has been used to conduct measurements is shown in [Figure 10](#).

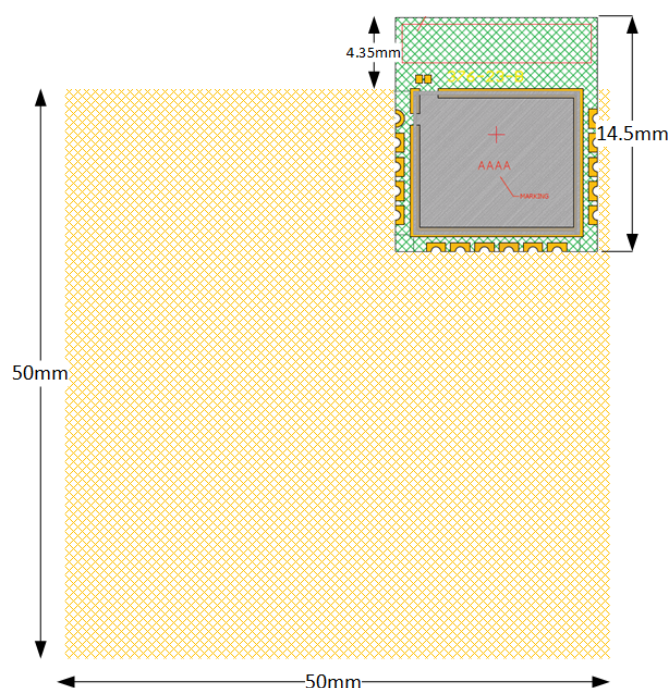


Figure 10: DA14531 TINY™ Module Evaluation Board

8.2 Antenna Graphs

The antenna VSWR measurements for the three installation positions are given in the following figures.

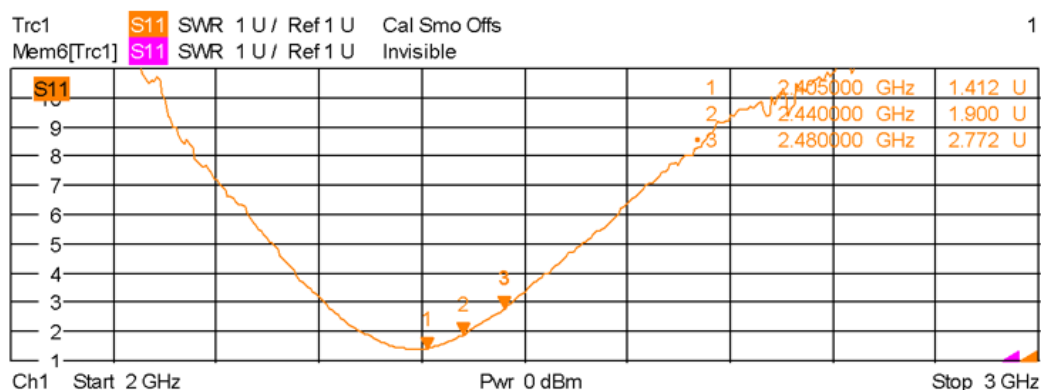


Figure 11: VSWR Installed in the Upper Left Corner (Position #1) of Evaluation Board

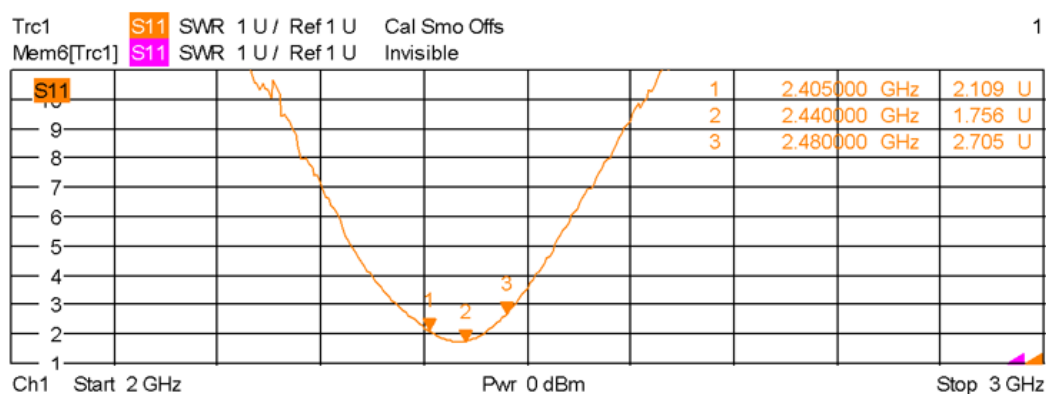


Figure 12: VSWR with Module Installed in Center (Position #2) of the Evaluation Board

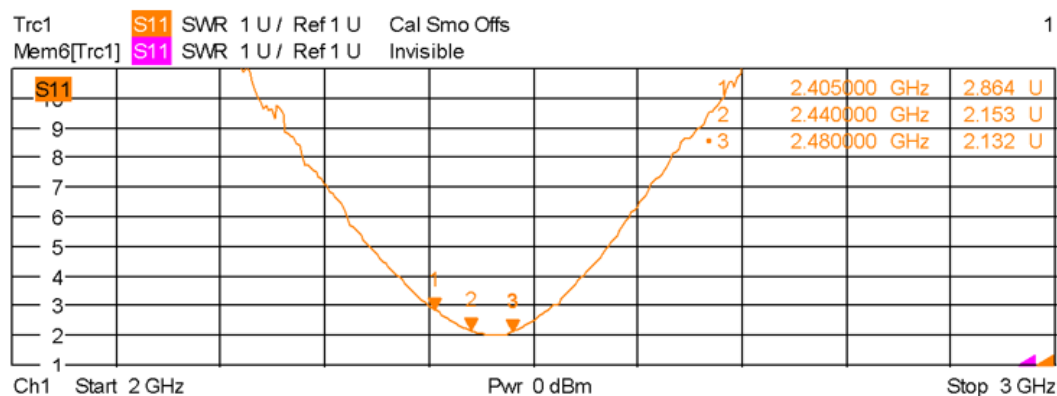


Figure 13: VSWR with Module Installed in the Upper Right Corner (Position #3) of the Evaluation Board

8.3 Radiation Pattern

The antenna radiation pattern measurements are carried out in an anechoic chamber. Radiation patterns are presented for three measurement planes: XY-, XZ- and YZ- planes with horizontal and vertical polarization of the receiving antenna.

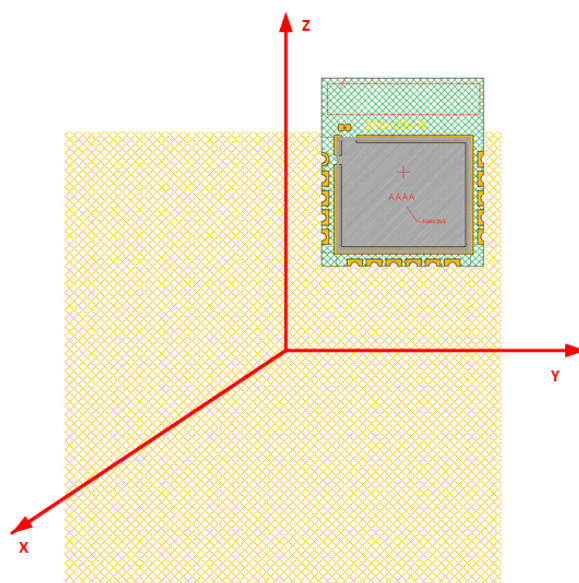


Figure 14: Measurement Plane Definition

Measurements are carried out for the module installed in the upper right corner on the reference board with no laminate below the antenna trace.

Radiation Pattern for Antenna Trace

Horizontal polarization

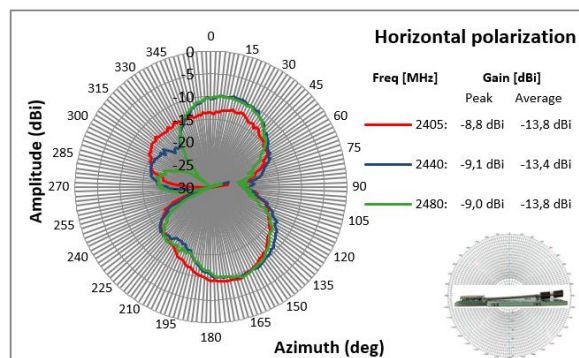


Figure 15: Radiation Pattern for XY-Plane, Horizontal Polarization

Vertical polarization

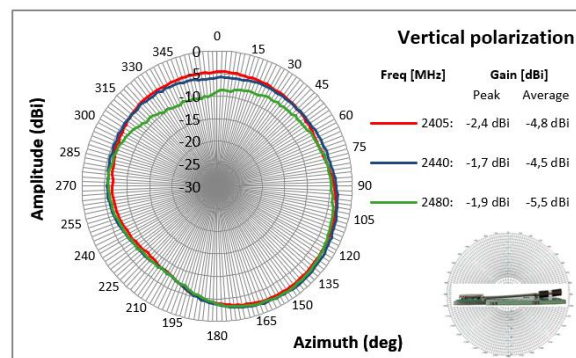


Figure 16: Radiation Pattern for XY-Plane, Vertical Polarization

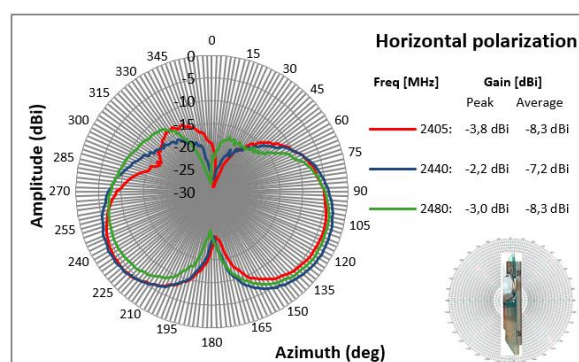


Figure 17: Radiation Pattern for XZ-Plane, Horizontal Polarization

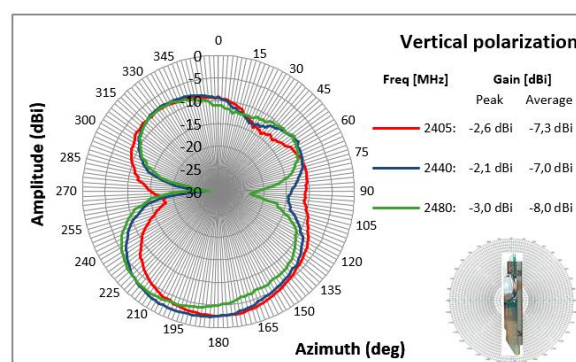


Figure 18: Radiation Pattern for XZ-Plane, Vertical Polarization

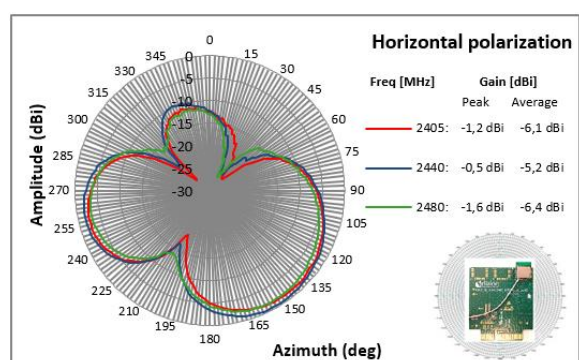


Figure 19: Radiation Pattern for YZ-Plane, Horizontal Polarization

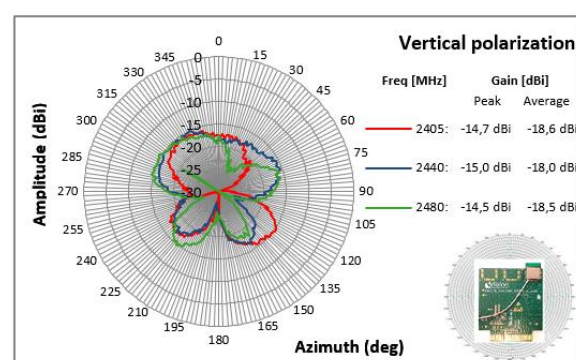


Figure 20: Radiation Pattern for YZ-Plane, Vertical Polarization