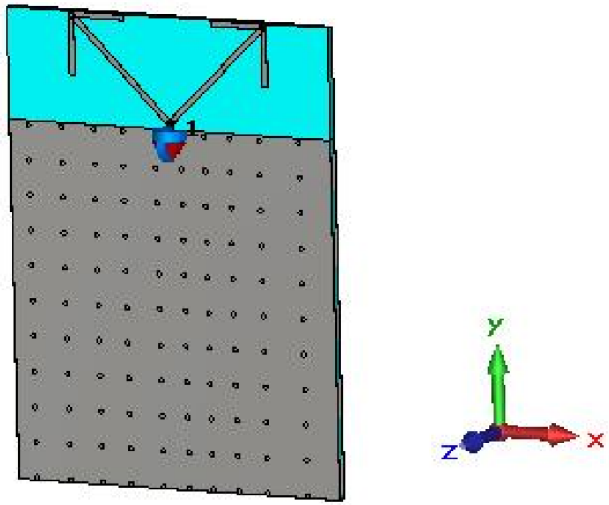
SW TECHNOLOGY Ltd.

Purpose: to prove the proposed 2.4G antenna has better performance

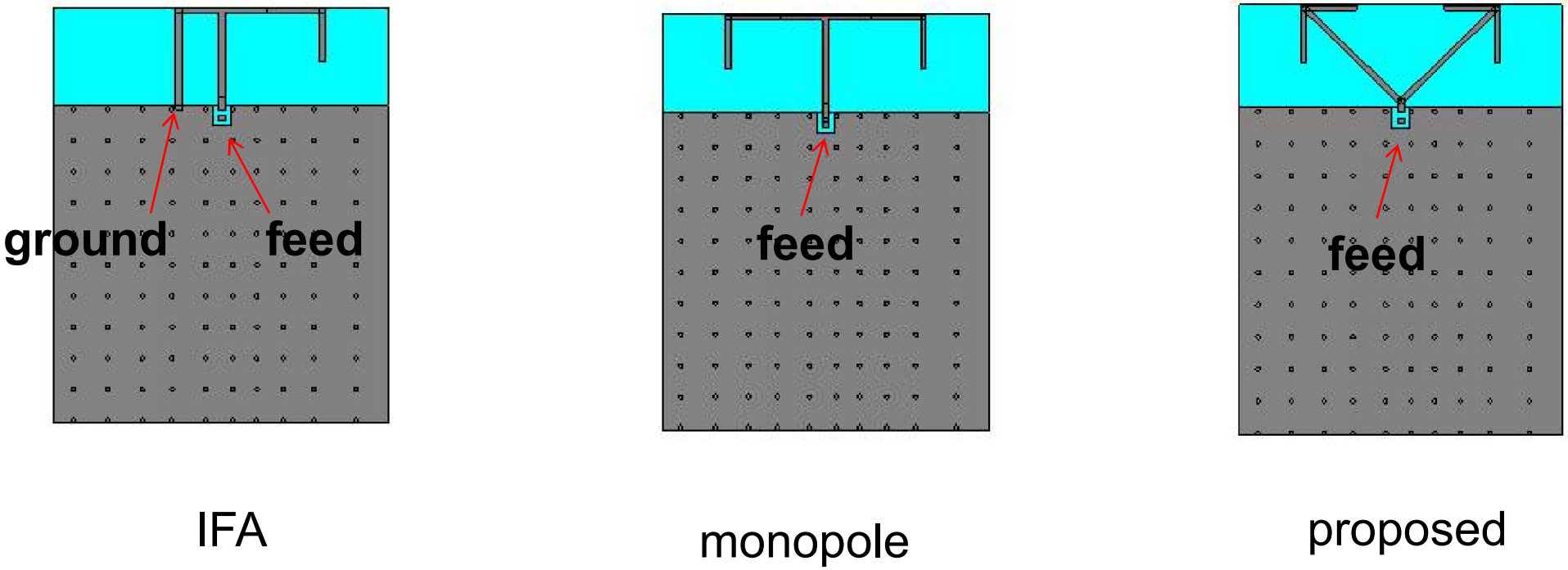
JACKY HU/2015-11-23

Antenna specification/requirement

- return loss: S11 <= -6dB
- antenna gain: high and flat in entire BT band
- antenna efficiency: >=60% (-2.2dB)
- radiation pattern flatness: <= 1.5dB, uniform radiation pattern in horizontal (XZ) plane

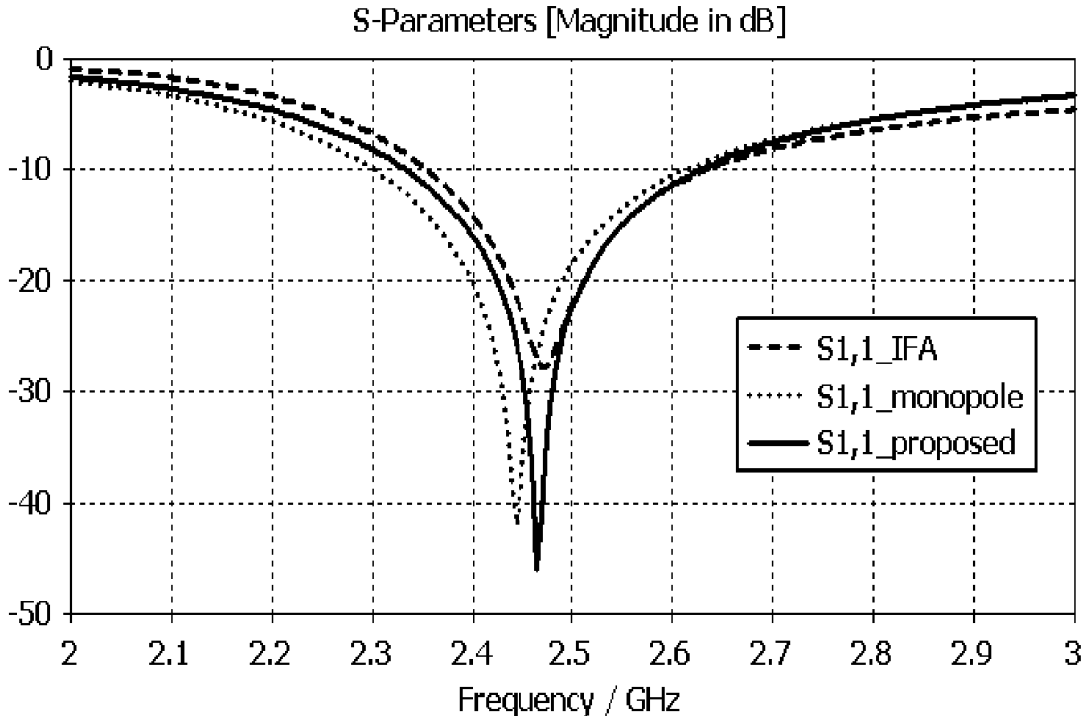


Traditional & proposed 2.4G Antennas



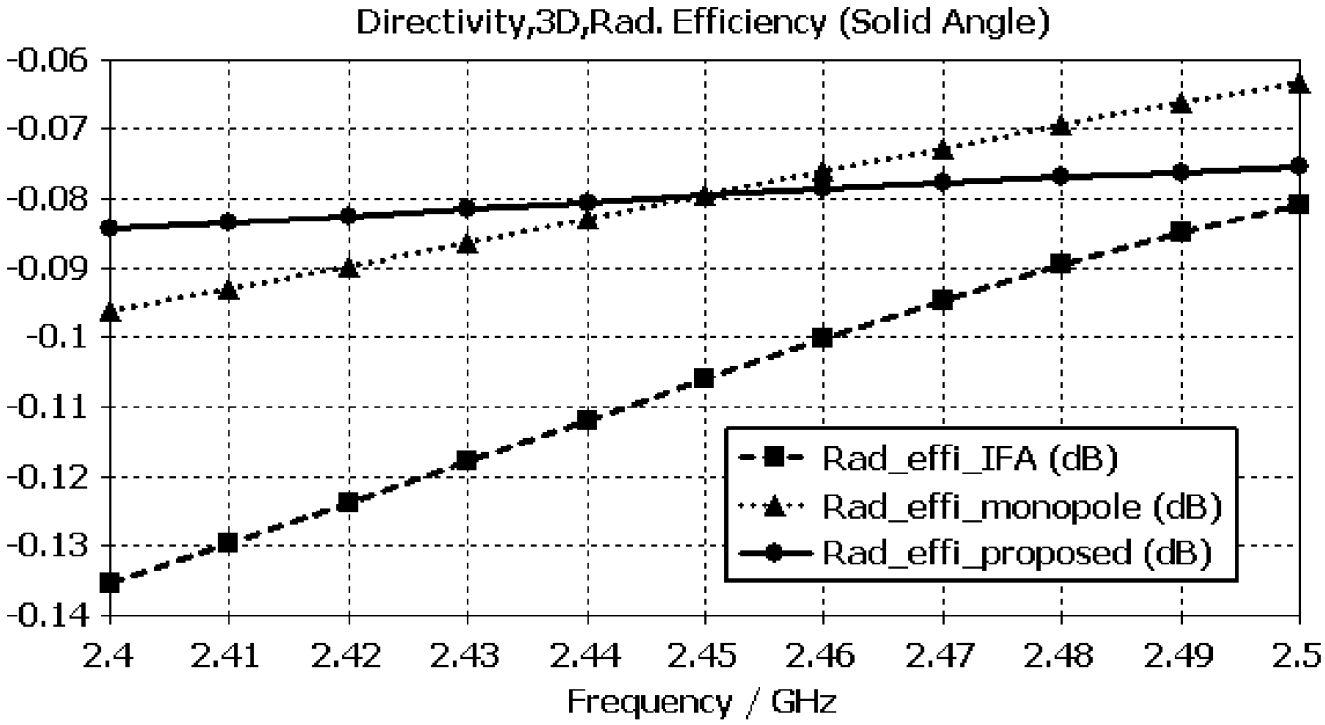
- Traditional type 2.4G antenna: IFA (inverted-F) and monopole antennas
- Proposed antenna: V-type antenna

Comparison of different antennas in S11



- Similar antenna performance in S11 is obtained

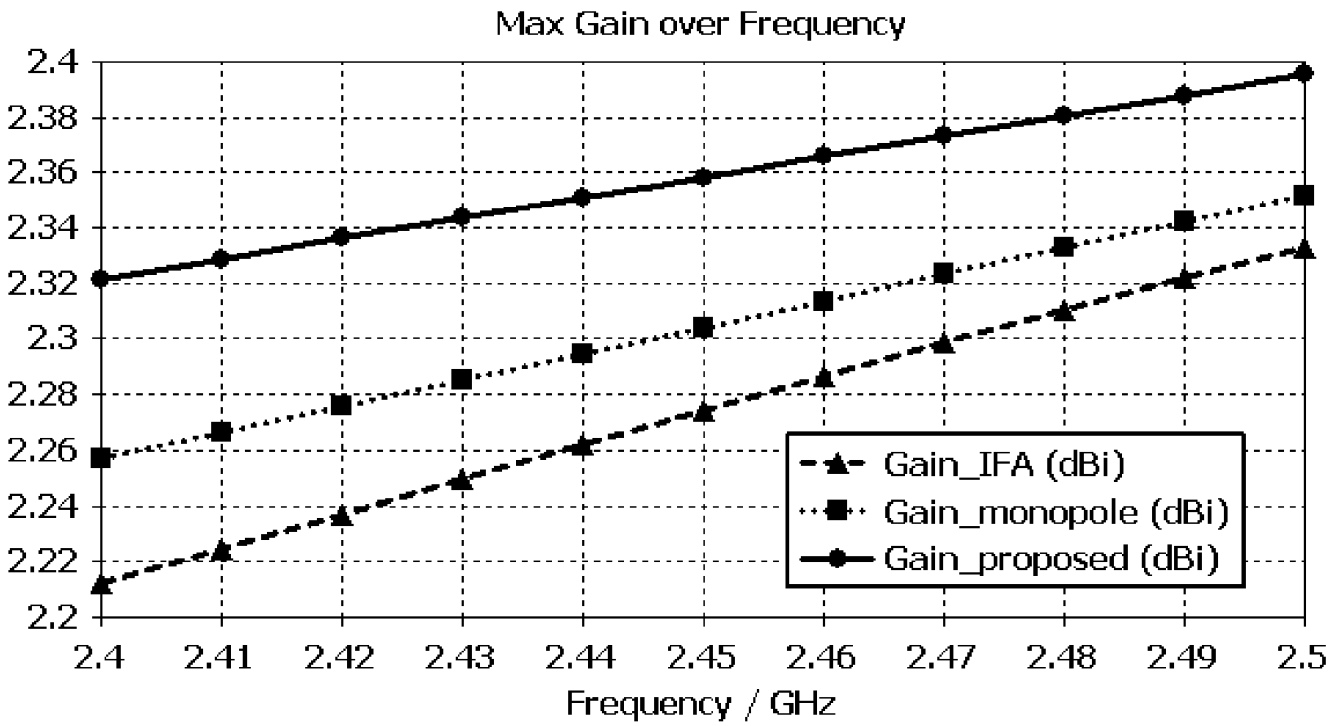
Comparison of different antennas in antenna radiation efficiency



◆ In the entire 2.4G band (2.4-2.48GHz), the antenna efficiency of the proposed antenna is better than that of IFA antenna

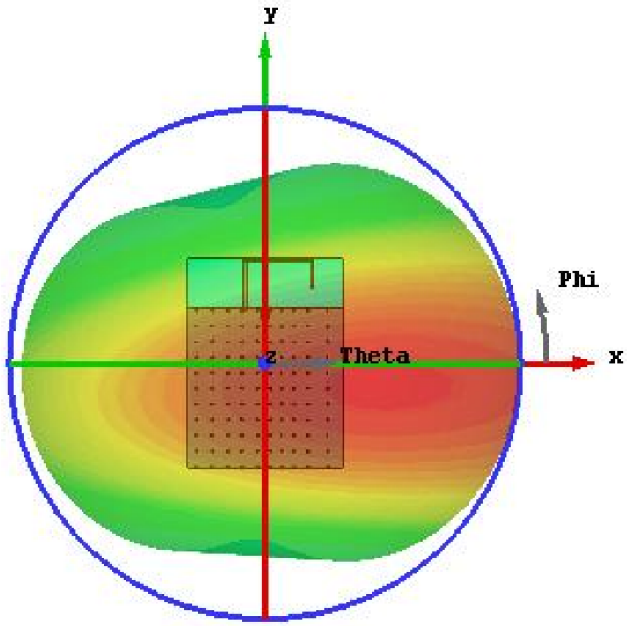
◆ In particular, the antenna radiation efficiency of the proposed antenna is more flat or uniform than that of the monopole antenna, which leads to a better overall antenna performance

Comparison of different antennas in antenna gain

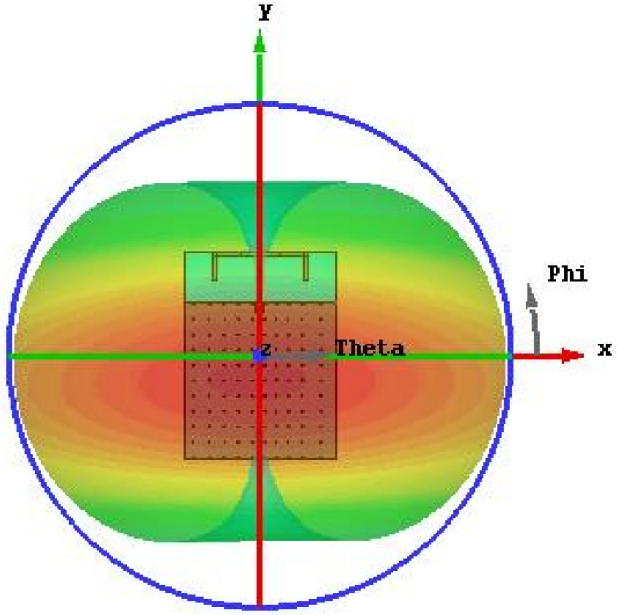


◆ In the entire 2.4G band (2.4-2.48GHz), the antenna gain of the proposed antenna is better than that of IFA and monopole antennas

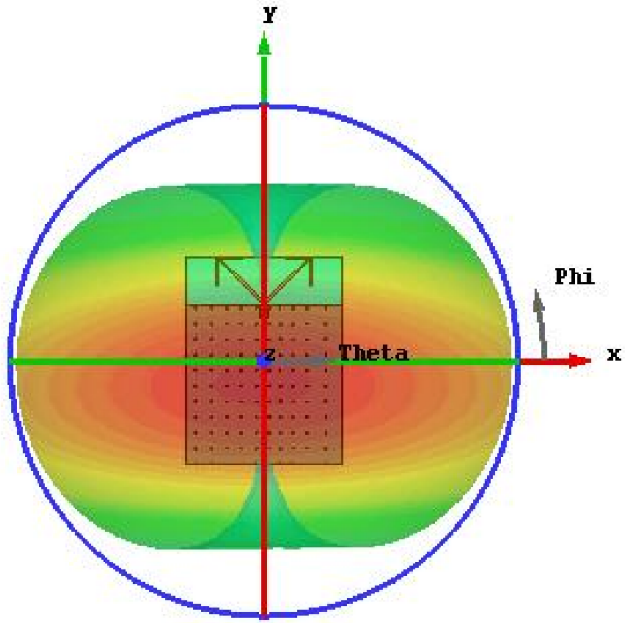
Comparison of different antennas in 3D radiation pattern at 2.44GHz



IFA:
Worse radiation pattern

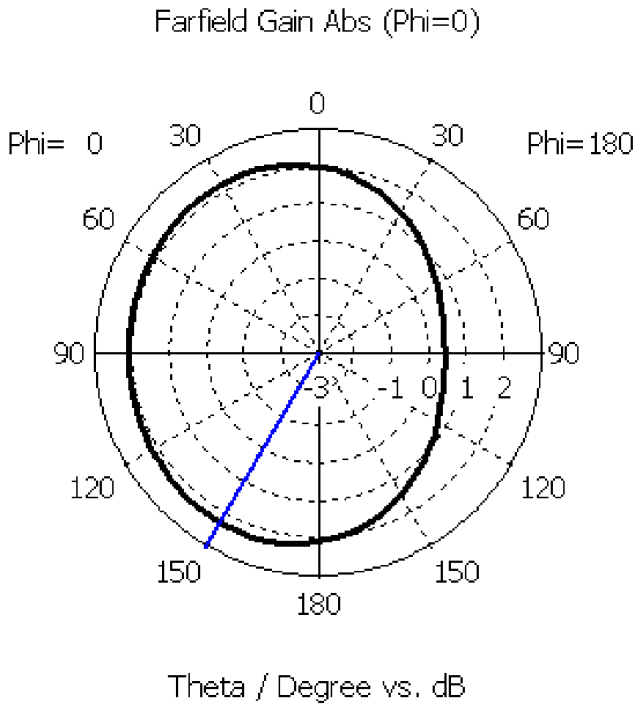


Monopole:
Good radiation pattern

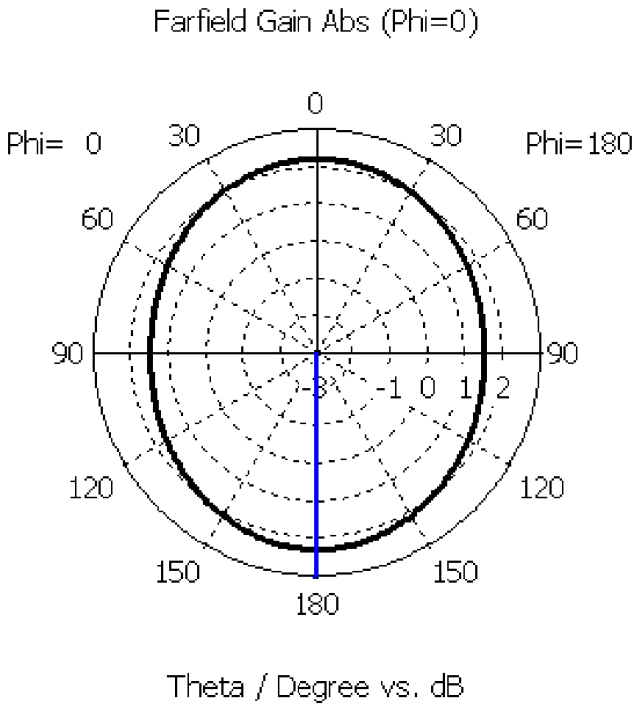


Proposed:
Better radiation pattern

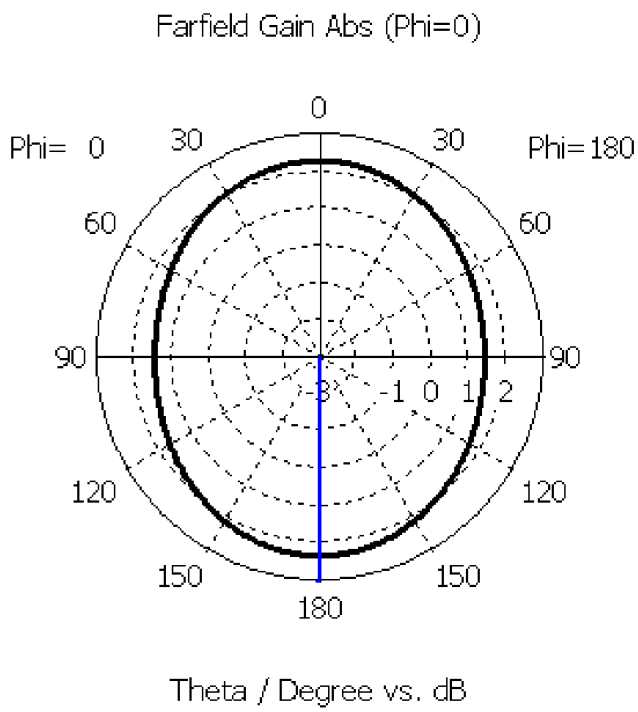
Comparison of different antennas in XZ-plane radiation pattern at 2.44GHz



IFA:
Worse radiation pattern



Monopole:
Good radiation pattern

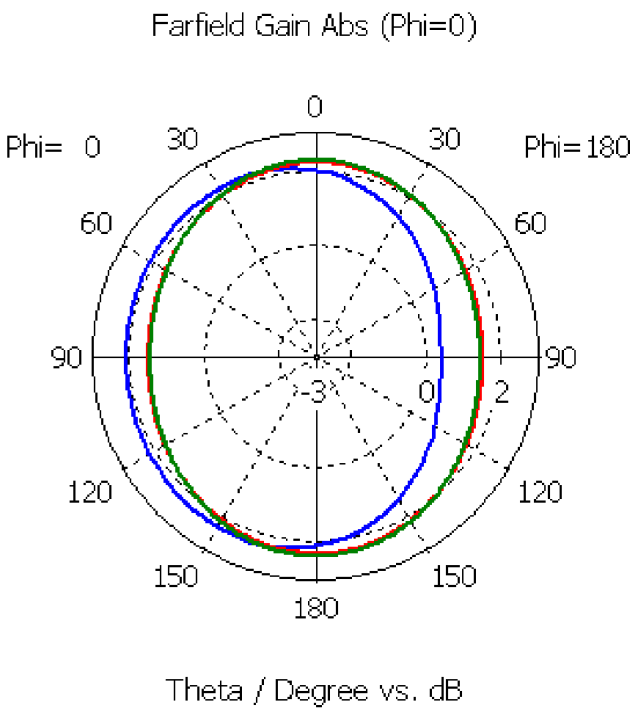


Proposed:
Good radiation pattern

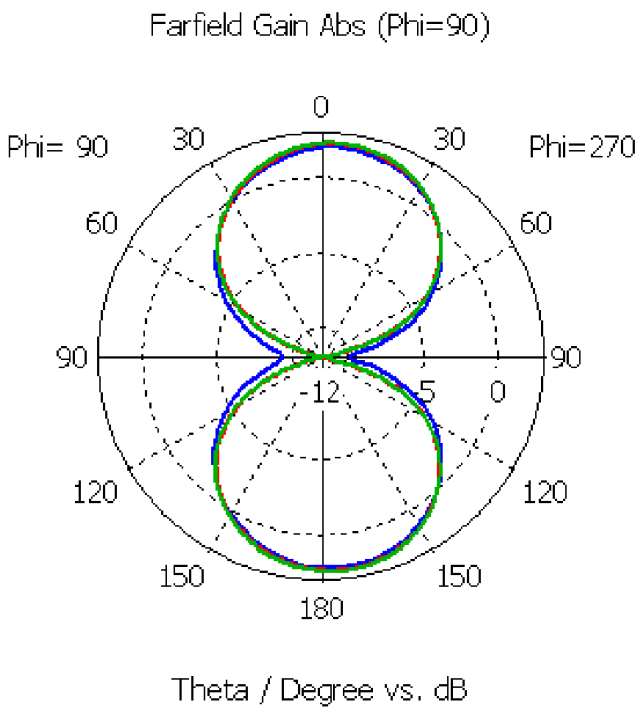
◆ XZ or horizontal plane is the plane that we should care about. The good radiation pattern in this plane means that the antenna will have better performance.

Comparison of different antennas in XZ, YZ, and XY-plane radiation pattern at 2.44GHz

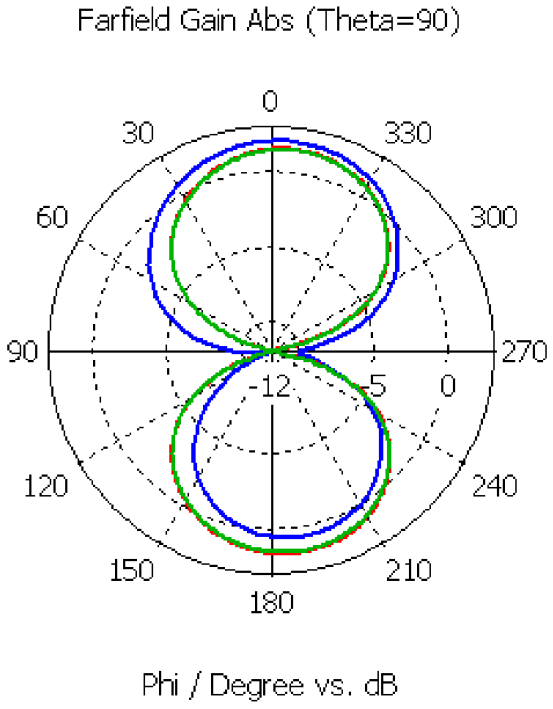
XZ plane



YZ plane



XY plane

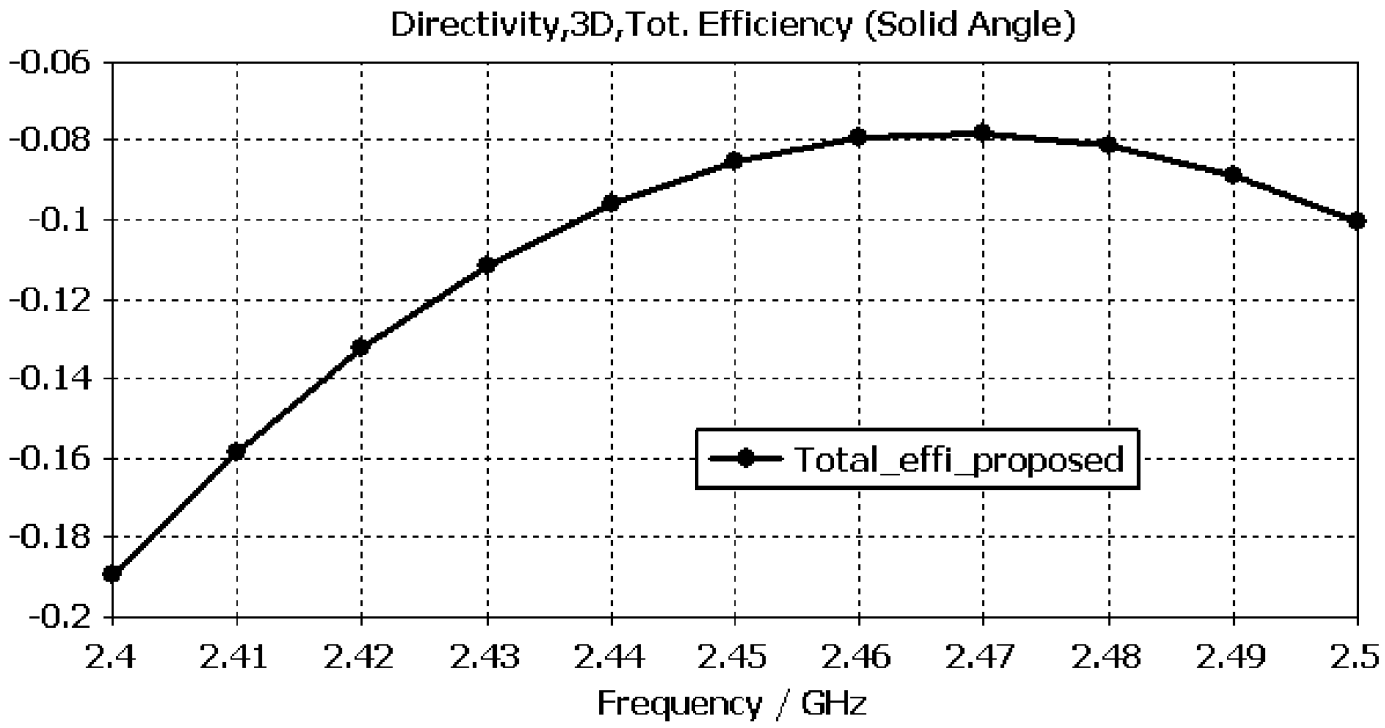


farfield (f=2.44)_IFA

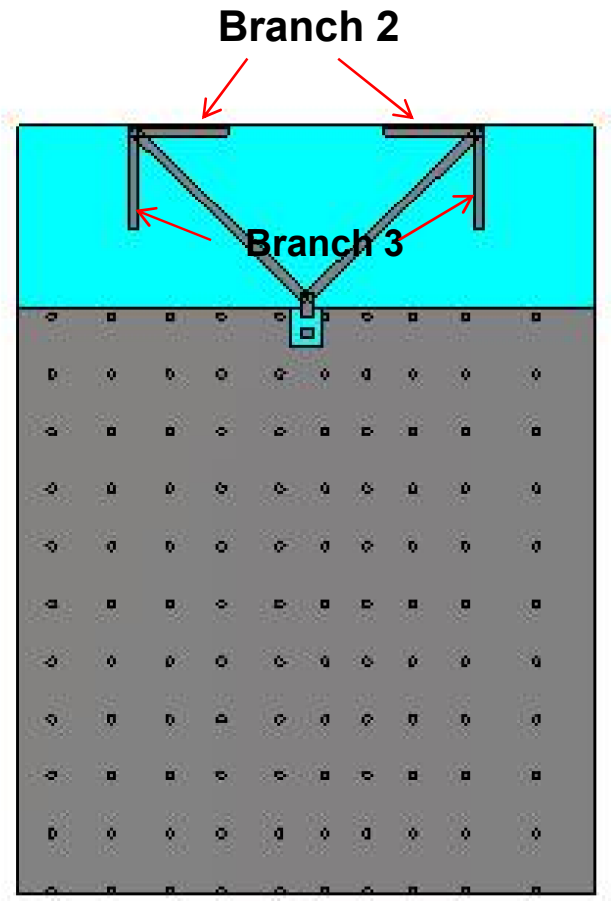
farfield (f=2.44)_monopole

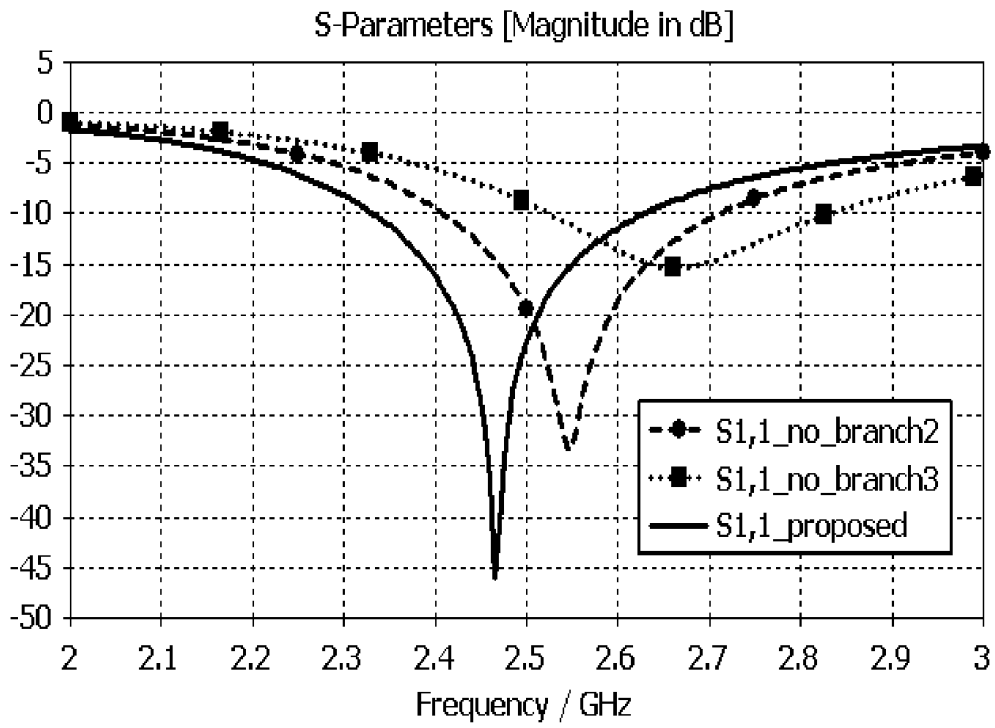
farfield (f=2.44)_proposed

Total Antenna Efficiency of Proposed antenna



Parameter study of proposed antenna





◆ branches 2&3 are used to reduce the size of V-type antenna or to tune the antenna resonance frequency; and to fine tune the impedance matching of the antenna

4.9
1.2
5.4
13
1.2
1.2

Conclusions

◆ the proposed V-type antenna has better performance than IFA and monopole antennas because:

- ➢ it has better antenna gain and radiation efficiency
  - ➢ in the entire band the gain of proposed antenna has better flatness than that of monopole antenna
- ➢ in the horizontal plane, the radiation pattern of the proposed antenna is better than that of IFA antenna

THE END