

# Design of Triangular Microstrip Patch Antenna at Super High Frequency

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**Abstract :** A new design for broad band triangular microstrip patch antenna using probs fed. Return loss at the centre frequency is -12.48 dB at 10.075 GHz. The VSWR bandwidth of the proposed antenna is extremely closer to the value of 1.5 and the VSWR at the centre frequency is 1.4

## I. INTRODUCTION

Radar and other communication system such as satellite, Global Position System ( GPS ) often require broad band frequency operation.

Broad band frequency operation of triangular microstrip antennas have been studied by many researchers using probe feed[1]-[2]. This paper report the simulation result using triangular patch antenna with probs fed. This paper therefore proposed a design of broad bend operation of triangular microstrip antenna using HFSS (high frequency structure simulator) which is commercially available in the market and the it depend on the FEM(finite element method ) analysis.

## II. ANTENNA DESIGN

The geometry of the proposed antenna using a broadband operation fed by a probe is shown in fig.1. The proposed antenna is constructed on a dielectric substrate which has a dielectric constant 3.27 ,& loss tangent .002 . The area of the triangular patch antenna is situated on the substrate with dimension  $1/2(30 \times 18)$

The antenna is a broadband triangular microstrip patch antenna at the center frequency  $f_c$  is 10GHz. The bandwidth of the antenna is lies between the X & Ku band.

## III.SIMULATION RESULTS

The return loss of the proposed triangular microstrip patch antenna at the super high frequencies is shown in Fig. 2.This simulated result shows a wide band width below to the -10dB so we can operate this antenna in the entire band width and one dips at which the return loss is minimum. This means, proposed antenna can operate efficiently at this frequency 10GHz.

The return loss and VSWR shows in fig. 2&3 and we can see here the antenna have resonance the radiation pattern is shown in fig -4. By varying the position of coaxial prob for the input impedance matching of the feeding system can be characterized. Figure 1 shows the return loss of -12.01 dB can be achieved . This result is achieved by using an ordinary triangular patch antenna then is fabricated using this result

Furthermore, the radiation pattern of the proposed antenna are also measured. The radiation pattern of the band width are shown in Figure 4 and Figure 5 for frequency  $f_c = 10.07$  GHz .

## IV. CONCLUSION

A basic configuration to excite a broadband operation of the triangular microstrip patch antenna with a probe fed has been simulated & studied. It is shown that the resonant frequency between X & Ku band .The design antenna can be used in the radar and telecommunication.

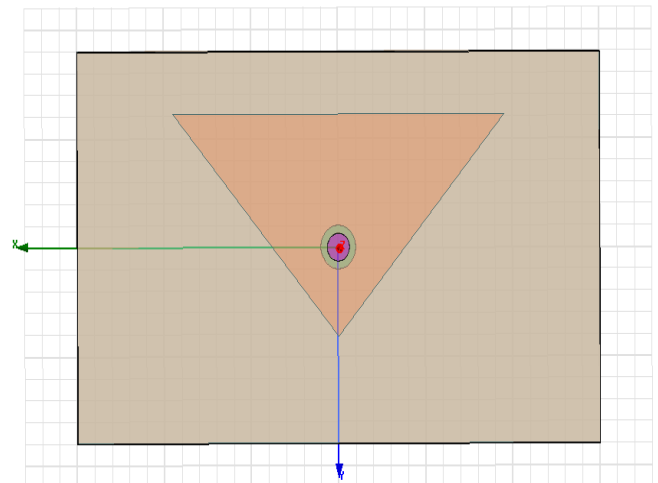


Figure 1. Geometry of the proposed antenna with the dimension  $1/2(32 \times 18)$  mm,

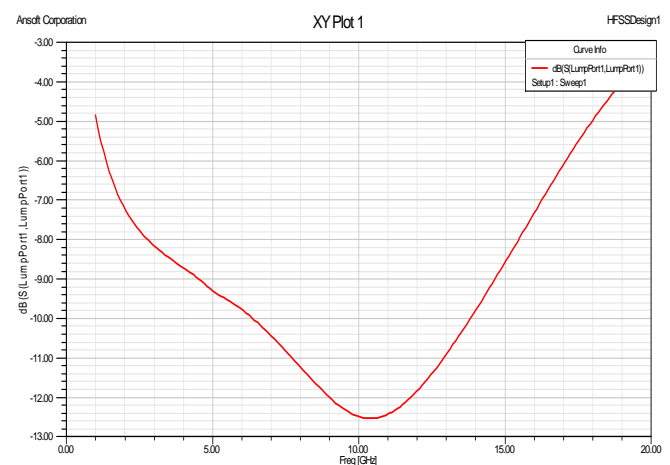


Figure 2. Measured return loss

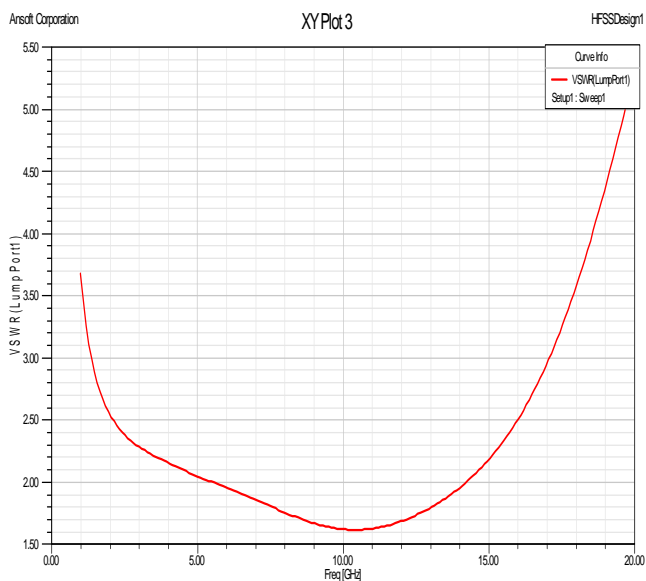


Figure3.Measured VSWR

**V.REFERENCES**

- [1] Fang, S.T and Kin Lu Wong, “A Dual Frequency Equilateral Triangular Microstrip Antenna With Pair Of Narrow Slots”, *Microwave And Optical Technology Letters*, Vol.23, No.2, October 1999
- [2] Lu, J.H and Kin Lu Wong, “Single Feed Dual Frequency Equilateral Triangular Microstrip Antenna With Pair Of Spur Lines”, *Electronics Letters*, vol.34, No.12, June 1998( i ) ( ii )

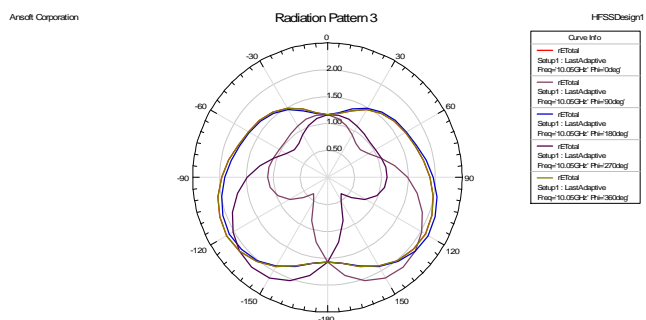


Figure 4. Radiation pattern 2D

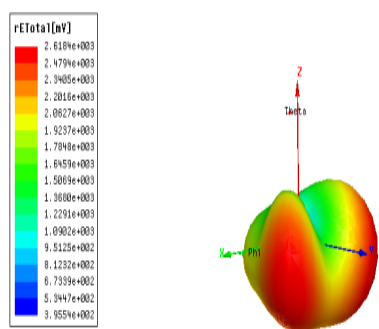


Figure 5. Radiation pattern in 3D