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DESIGN AND ANALYSIS OF MICROSTRIP PATCH ANTENNA FOR WIMAX APPLICATION

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ABSTRACT:

In this paper a noble microstrip antenna for WiMax application is designed. This antenna is designed using FR-4 Material having thickness of 1.6 mm. This antenna covers the frequency range from 3.09- 3.63 GHz. This antenna is useful for WiMax application. HFSS (High Frequency Structured Simulator) is used for the simulation purpose.

KEYWORDS: noble microstrip antenna, WiMax application.

I. INTRODUCTION

Due to the advancement of wireless communication, antenna takes great attention . Microstrip antenna takes great attention due to its low profile, less weight and low cost. Wimax application of the wireless communication is very useful. There are many literature are available [3-5], that show the effect of slots on the performance of antenna .

II. ANTENNA CONFIGURATION

Fig.1 shows the proposed geometry of WiMax antenna. Partial ground of size 12X30 mm² is used . Dielectric material FR-4 is used. It has thickness of 1.6mm and loss tangent of 0.02 . The complete size of the antenna is 30X30X1.6 mm³.

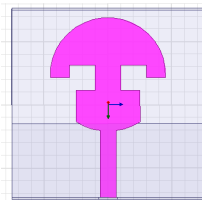
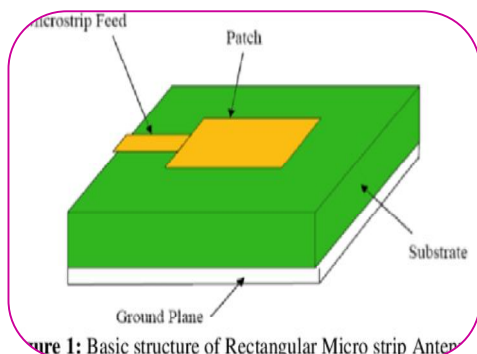


Fig1. Proposed Antenna Geometry



III. SIMULATION AND RESULT

For the simulation purpose HFSS (High frequency structured Simulator) is used. Various parameters are observed .These parameters are S_{11} return loss, VSWR, 3-D radiation Pattern, 2-D radiation pattern.

Fig 2 shows the graph between frequency Vs return loss. It is found that the antenna is operating in the frequency range of 3.09-3.63 GHz.

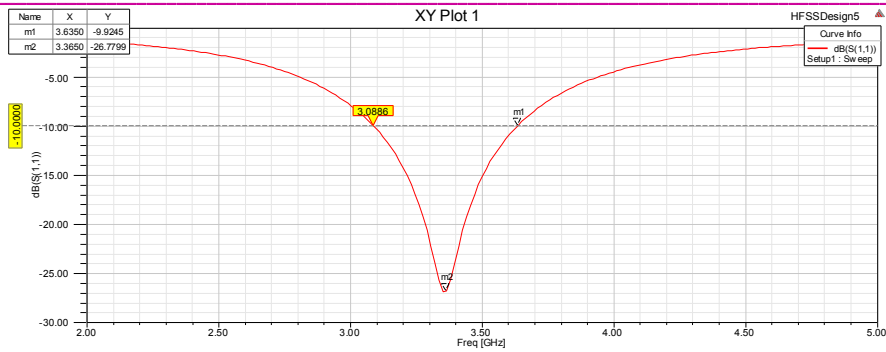


Fig 2. S_{11} (Return Loss) Vs Frequency of proposed antenna

Fig 3 shows the VSWR Vs Frequency graph of the proposed antenna. It covers the range from 3.06-3.64 GHz. For the designing of antenna VSWR should be less than 2 or 2 is considered.

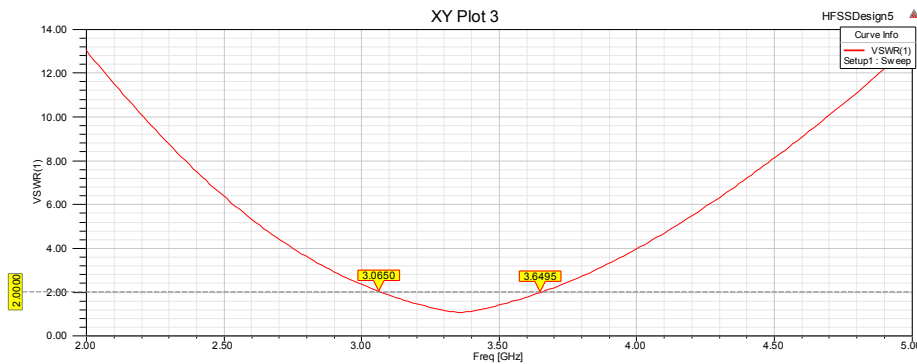


Fig 3. VSWR Vs Frequency graph of the proposed antenna

Fig 4. shows the 3-D radiation pattern of the proposed antenna at the frequency of 3.35 GHz. It shows that the radiation pattern is omnidirectional and it radiates uniformly in all directions with the gain of 2.595dBi.

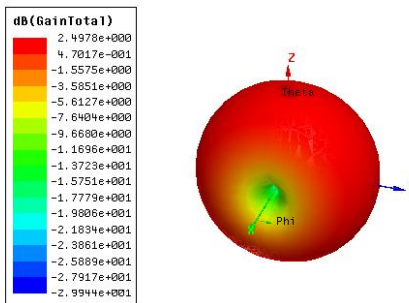


Fig 4. 3 D Radiation Pattern of Proposed antenna at frequency of 3.36 GHz

Fig. 5 shows the 2-D radiation pattern of the proposed antenna at 3.35 GHz on $\phi=0^\circ$ and 90° . It shows that at $\phi=0^\circ$ its pattern is like a figure of Eight. And at $\phi=90^\circ$ it is like a circle.

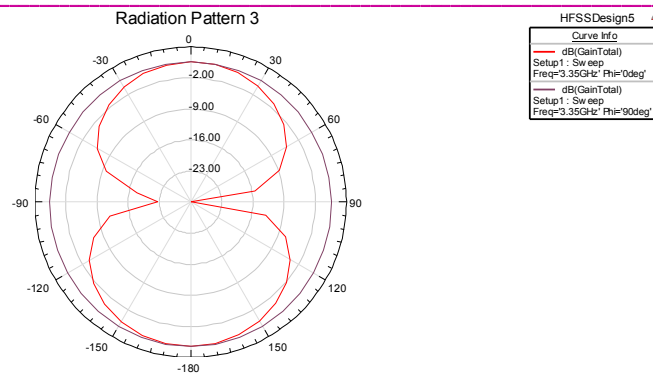


Fig 5. 2-D Radiation Pattern of proposed antenna at frequency of 3.35 GHz.

IV CONCLUSION

In this paper a simple microstrip patch antenna for WiMax application is proposed. In this antenna FR-4 material. This antenna covers the frequency range of 3.09-3.63 GHz. Various antenna parameters are calculated on the HFSS software. This antenna is useful for WiMax application.

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