A Patch Antenna at 2.4 GHz Frequency for Bluetooth

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***Abstract*-The proposed antenna is used at 2.4 GHz.The size of antenna is is 60x60x1.6 mm3.The used substrate is Fr4 having the dielectric constant is 4.4. The size of the patch is 29.8x38.4 mm2.The return loss for the antenna is -46.26dB and the gain is 4.45 dBi. The antenna can be used for longer wave transmission.**

Keywords-Gain, Return loss, VSWR.

1. INTRODUCTION

The 2.4 GHz frequency can be used for the transmission of waves through the walls and many other solid objects. The antenna can be used in WLAN applications, repeaters, routers etc. In this proposed antenna we usese Fr4 substrate.
We use microstrip patch antenna because it is easy to fabricate. It has many advantages like
a) Multiple frequency operations are possible
b) Light weight and low profile antenna etc.

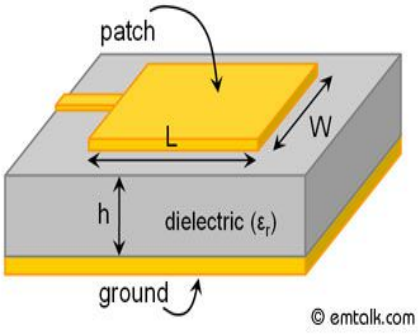


Fig. 1: Microstrip patch antenna

2. ANTENNA DESIGN

The antenna size is 60x60x1.6 mm^3. Thse simulation is done by using CST Software. Fr4 substrate is used whose Er (dielectric constant) is 4.4. The length of substrate, The width of the substrate and ground are same i.e. 60x60 mm^2.

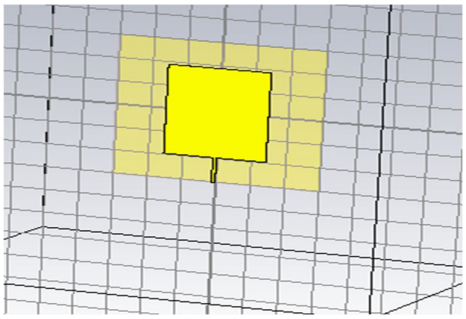


Fig. 2: Front view of antenna design

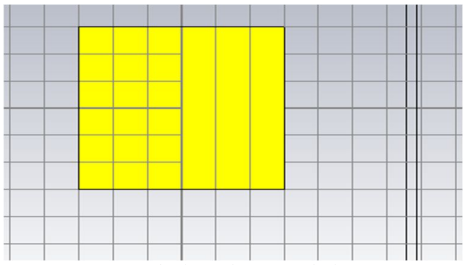


Fig. 3: Back view of antenna design

Table 1- Parameters for antenna design

Parameters	Value (mm)
Lg,Ls	60
Wg,W	60
lp	29.8
wp	38.4
H	1.6

3. RESULTS

3.1 S Parameters

S1,1 is also called Return loss. The achieved result for S1,1 parameter is 46.26dB.

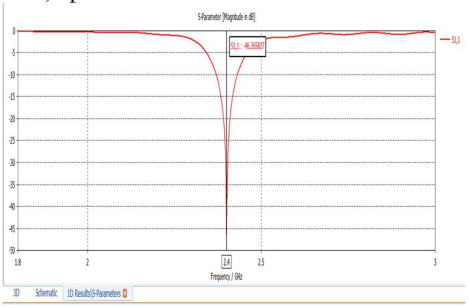
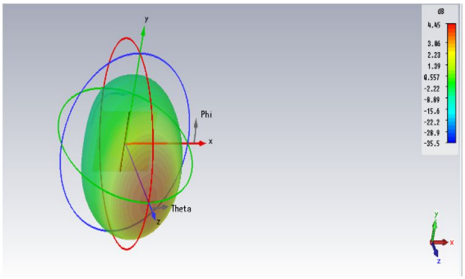


Fig. 4: S1,1 Parameters

3.2 Gain

Gain tells the how much an antenna is radiaded in any direction with respect to the other antenna. The observed gain is



3.3 Far filed results

Far field determines the angular dependency of strength of radiowaves from source to destination. Far fiels are ver important term in antenna because far fiels determines the radiation patterns of antenna. Here the results of E-Field and H-field are shown using CST Software.

(a) E field when phi=0 degree; and the main lobe magnitude is 4.45db
(b) E field when phi=90 degree; amd the main lobe magnitude is 4.45db
(c) H field when theta =0degree; and the main lobe magnitude is 4.45db
(d) H field when theta =90degree; and the main lobe magnitude is -5.14db

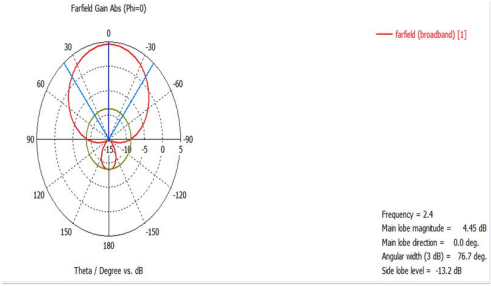


Fig. 6: E-field when phi=0 degree

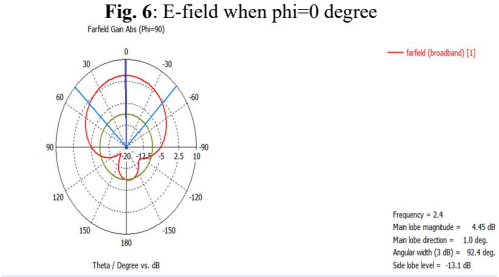


Fig. 7: E-field when phi=90 degree

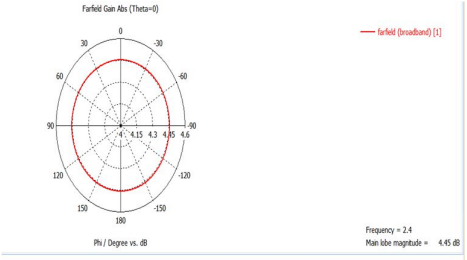


Fig. 8: H-field when Theta=0 degree

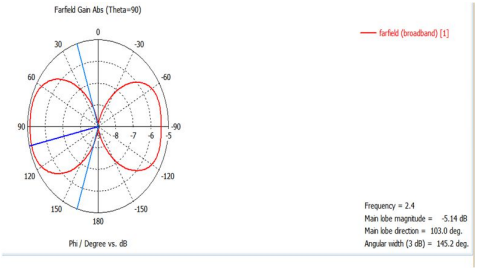


Fig. 9: H-field when Theta=90 degree

4. CONCLUSION

The obtained gain is 4.45 dBi and the return loss is -46.26dB. The propsed design is working well for 2.4 GHz frequency.

9. ACKNOWLEDGEMENT

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