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Review Of Research

SLOTTED MICROSTRIP PATCH ANTENNA FOR WLAN-SDMA SYSTEMS

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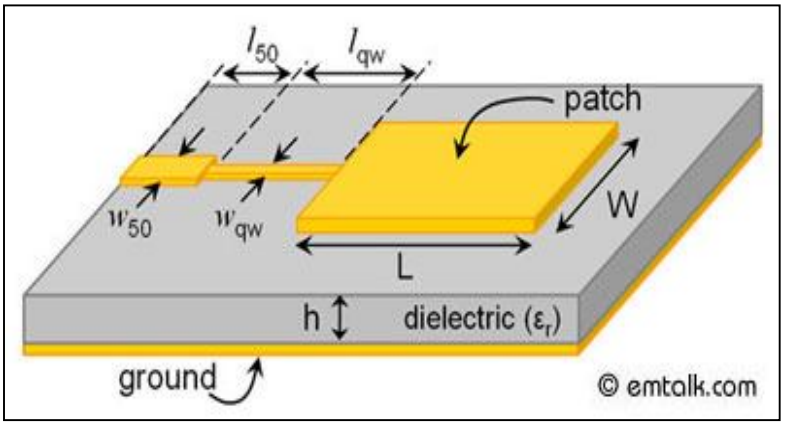

ABSTRACT

This paper presents the look and simulation of broadband slotted microstrip patch antenna victimization Zeland make IE3D, electromagnetic simulator.The two completely different configurations of broadband microstrip patch antenna, straightforward rectangular patch antenna & E formed patch antenna square measure analyzed. The performance of designed antennas is analyzed in terms of comeback loss, information measure and gain. The substrate employed in these two configurations is FR-4 having stuff constant 4.4. Once analyzing, the come back losses and gain of two completely different antennas square measure calculated. The calculated result for comeback loss of rectangular patch & E form patch square measure -21.93 decibel & -25.714 decibel and gain of rectangular patch & E form patch square measure 6.787 db & 8.284db respectively.

KEYWORDS: *Patch antenna, IE3D , Rectangular Patch & E –Shape patch.*

I. INTRODUCTION:

Slotted microstrip antenna is a perfect alternative for wireless communication because of low profile, light-weight , conformal shaping, low cost ,simplicity of producing and straightforward integration to circuit [1].However, typical microstrip patch antenna suffers from terribly slender information measure, usually concerning five-hitter information measure with relevancy central frequency. In recent years, there's a requirement for a lot of compact antennas because of fast decrease in size of private communication devices [6-9]. As communication devices become smaller because of larger integration, the antenna becomes a considerably larger apart of the general package volume. This ends up in a requirement for similar reductions in antenna size. Additionally to the present, low profile antenna styles are necessary for fastened wireless application. The microstrip antennas employed in a large variety of applications from communication systems to satellite and medical applications. There are varied and accepted methodology to extend the information measure of antennas, as well as increase of substrate thickness, the employment of low stuff substrate [2]. Due to analysis of wireless communication, several high performance mobile devices are developed that need economical mean of communication i.e. it ought to have low come back loss & high information measure.[4-5].

II. ANTENNA DESIGN

In this section, structure of patch antennas are discussed, rectangular patch, E shape patch configuration are simulated by Zeland make IE3D,

electromagnetic simulator software in order to decrease return loss and increase bandwidth.

A. Rectangular Patch Antenna

A Rectangular patch antenna is designed and simulated here. Dimension is given in fig. 1. Dimensions of patch are calculated using [3] and optimized dimensions are L=52.8mm, W= 47mm. Substrate with dielectric constant 4.4 and height 14.3 mm , x=23.2 mm. Patch is designed for operating frequency 6.895 GHz. Dimension of ground plate is calculated using following equation

Wg =6h+W

Lg = 6h+L

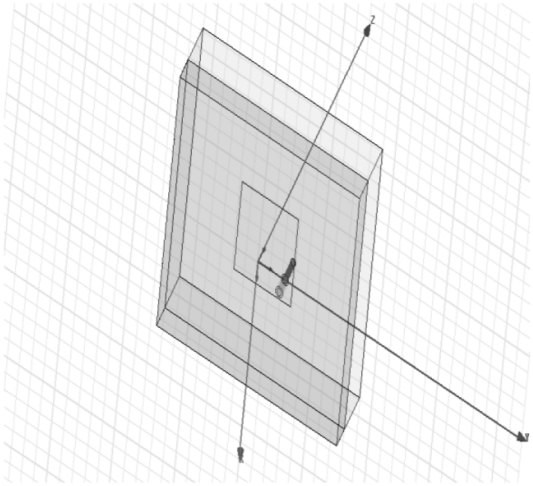

Fig 1. Top and Side view of rectangular patch antenna

After Simulation return loss is obtained -21.93 db with gain 6.787 db and bandwidth 7.13%. Frequency vs Return Loss plot & radiation pattern is shown in fig 2. & fig 3 respectively[4-7]

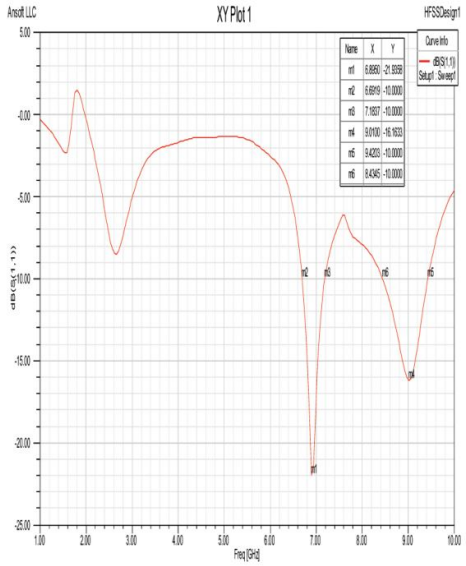

Fig 2. Frequency Vs return loss plot for rectangular patch antenna

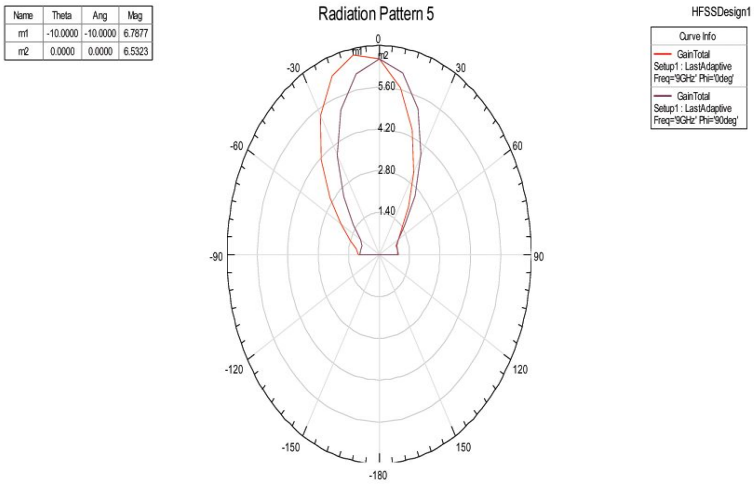

Fig 3. Radiation Pattern for rectangular patch antenna

B. E – Shaped Patch Antenna

E- Shaped patch antenna is designed and simulated here. Dimension is given in fig. 3.
Dimension of E shape patch is same as rectangular patch antenna with specific dimension Ws =16.3, P=6.3 and Y=22.5. Patch is designed for operating frequency 6.895.GHz.

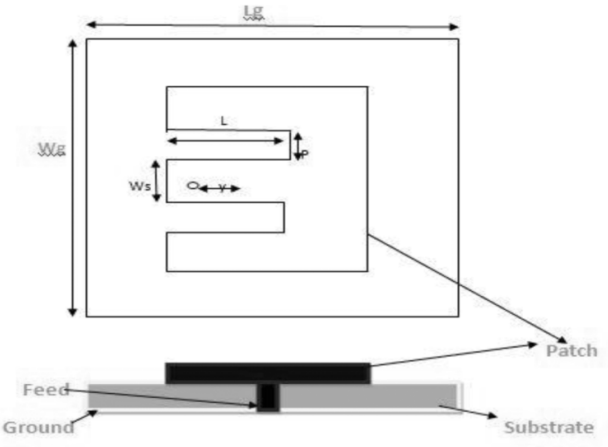

Fig 4. Top and Side view of E- Shaped patch antenna

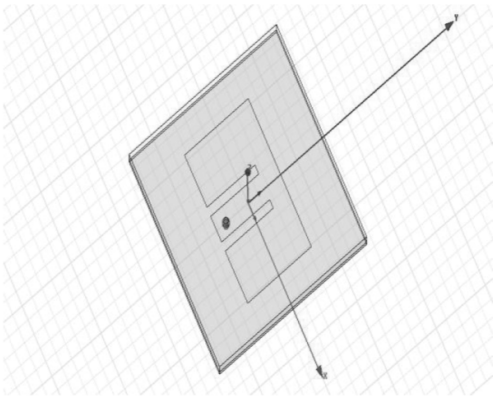

Fig 5. Top and Side view of E- Shape patch antenna in Zeland make IE3D, electromagnetic simulator

After Simulation return loss is obtained -25.7143 db with gain 8.284 db and bandwidth 8.69 %. Frequency vs Return Loss plot & radiation pattern is shown in fig 6 and fig 7. respectively

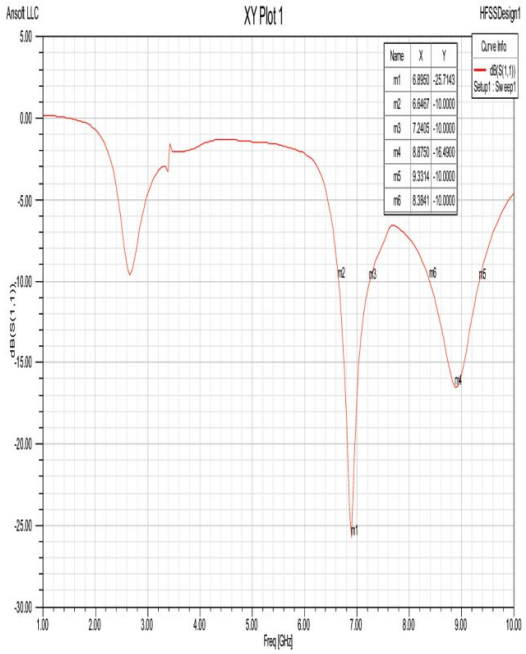

Fig 6. Frequency Vs return loss plot for E Shaped patch antenna

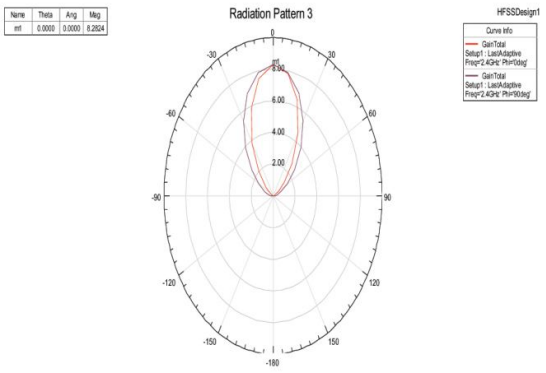

Fig 7. Radiation Pattern for E Shaped patch antenna

III. COMPARATIVE ANALYSIS

In this section, comparative analysis of two configurations is shown in tabular form. Return loss and bandwidth is compared in table 1.

Table 1. Comparative analysis of two configurations of Antenna

Sr. No.	Parameters	Rectangular Patch Antenna	E–Shape Patch Antenna
1.	FL(GHz)	6.6919	6.646
2.	FH(GHz)	7.1837	7.2404
3	F0(GHz)	6.895	6.895
4.	Bandwidth (%)	7.13	8.69
5.	Return Loss(db)	-21.935	-25.714
6.	Gain	6.787	8.284

IV. CONCLUSION

After Simulation, it is found that E –shaped patch antenna has low return loss with high gain and bandwidth. Simulated return loss is -25 .714 with gain 8.284 db and bandwidth 8.69% is obtained from E shaped patch antenna

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