Double Aero Shape Irregular Polygon Slotted Microstrip Antenna at 2.5 GHZ for Wi-Fi Application

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ABSTRACT
The design of a double aero shape irregular polygon (MSA) microstrip antenna with linear polarization radiation for WI-FI. The antenna have a 1.6mm substrate and having constant 4.4, Where the maximum return loss is -28dB and the output bandwidth is 40%, show that the proposed antenna is able to achieve VSWR less than 2.

I INTRODUCTION

Antennas are a very important component of communication systems. by definition, an antenna is a device used to transform an RF signal, traveling on a conductor, in to an electromagnetic wave in free space the broadband circularly polarized microstrip antennas play a vital role in wireless communication due to its low-profile, small-size and light weight. As well know, a circularly polarized wave can be obtained when spatially orthogonal modes are excited with equal amplitude. Conventional designs of microstrip antennas for circular polarization are usually achieved by truncating patch corners [1], cutting orthogonal slots in the square patch [2], through coupling cross-slot to excite the radiating patch [3],

The distance between the radiating patch and the ground plane is (1.6mm).

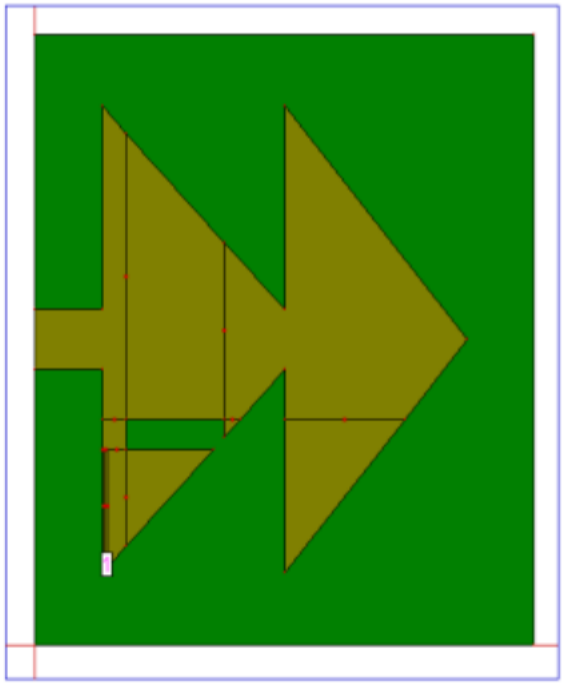

Fig. 1: Geometry of Proposed antenna on IE3D

II ANTENNA DESIGN

Fig. 1 shows the geomatery of the proposed microstrip antenna, The radiating aero shape patch, printed on a substrate of thickness h and relative permittivity 4.4 , has the dielectric material thickness is 1.6mm the length, L=29mm and the width W=31 mm and is excited by the two capacitive feed disks, which are oriented in orthogonal directions and have the distance of feed point is X= 5mm and Y=5.3 mm.

III SIMULATED RESULTS

To validate whether the design technique is applicable, the antenna has been simulated with IE3D shows the return loss and VSWR versus frequency of the proposed antenna .From the simulation results, we observe that the proposed antenna is able to achieve the return loss is -28 dB, and the VSWR less than 2.

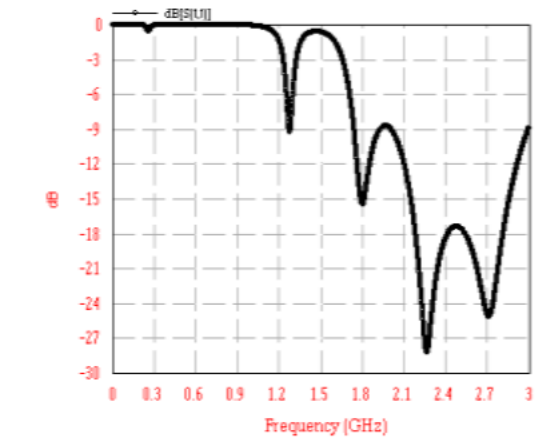

Fig. 2 : return loss Vs frequency.

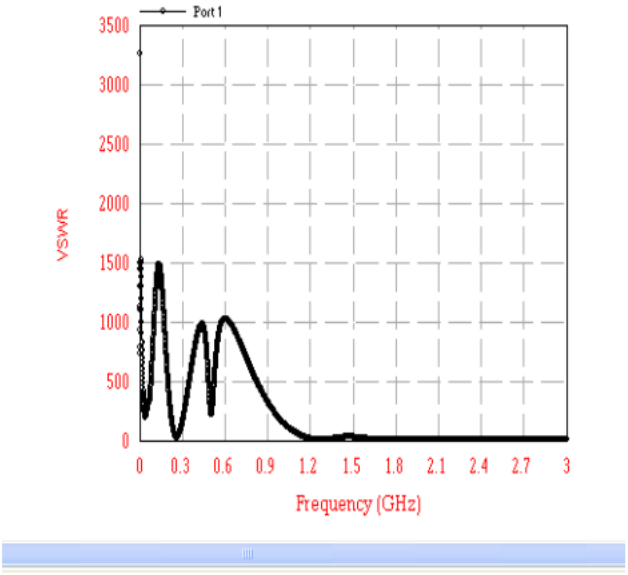

Fig. 3 VSWR versus frequency

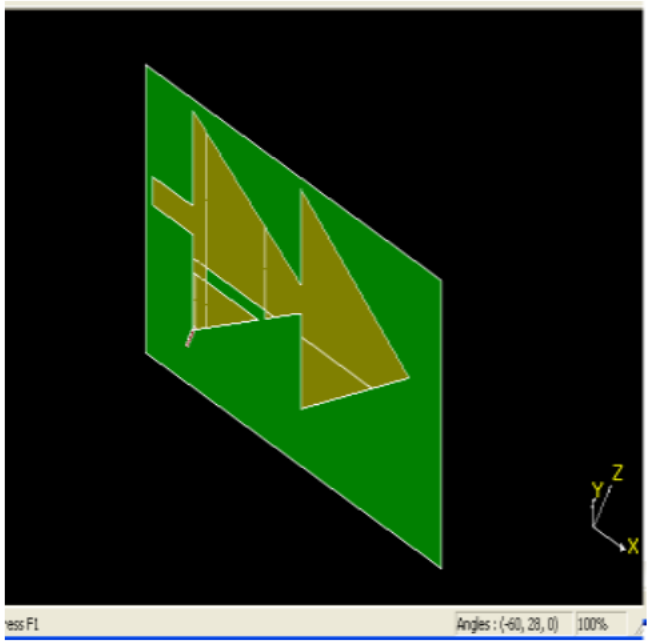

Fig. 5: 3D view of proposed Antenna

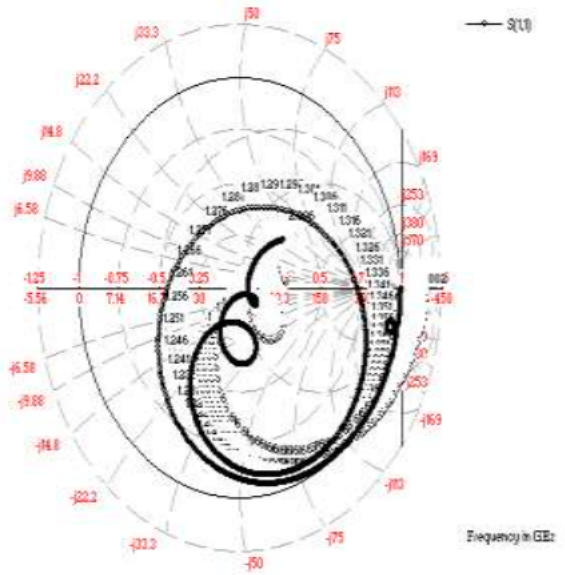

Fig. 4: smith chart of return loss

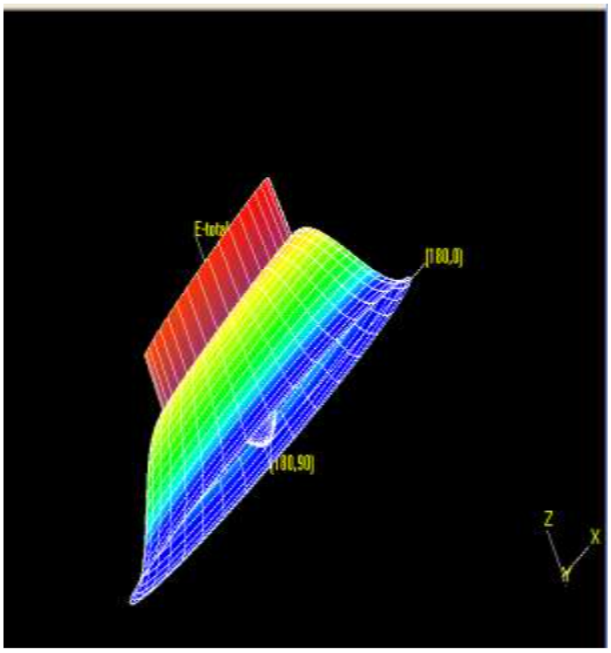

Fig. 6: 3D radiation pattern

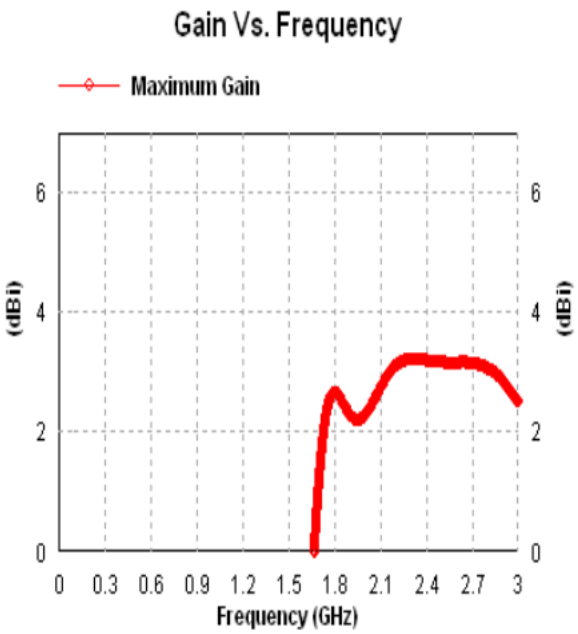

Fig. 7: Gain vs Frequency

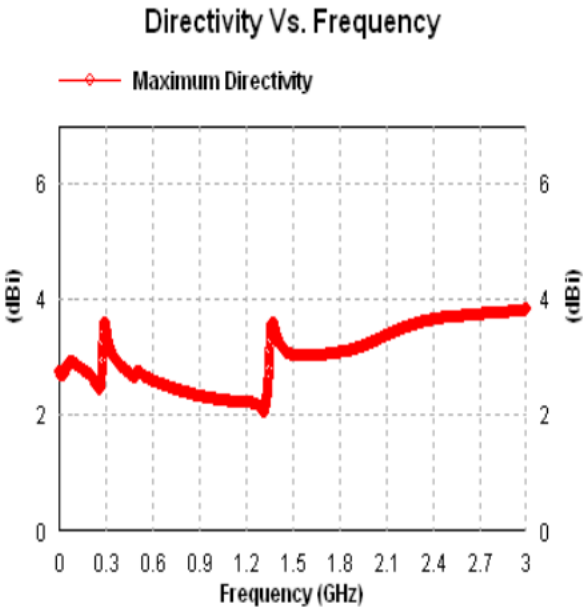

Fig. 8: Directivity vs frequency

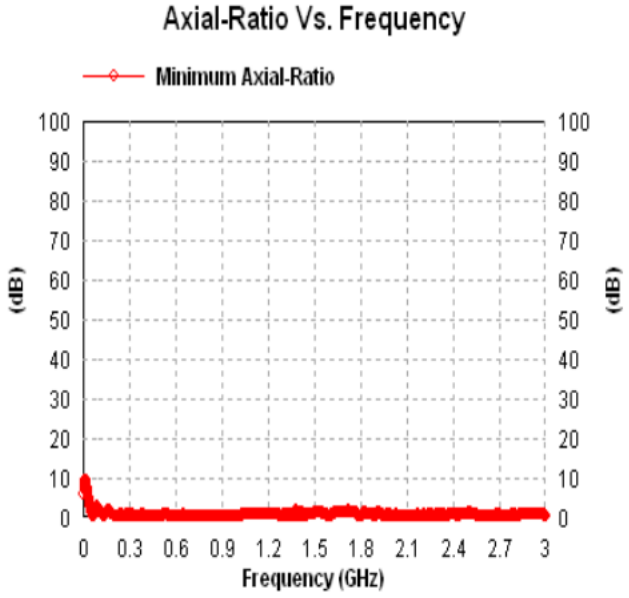

Fig. 9: Axial ratio vs frequency

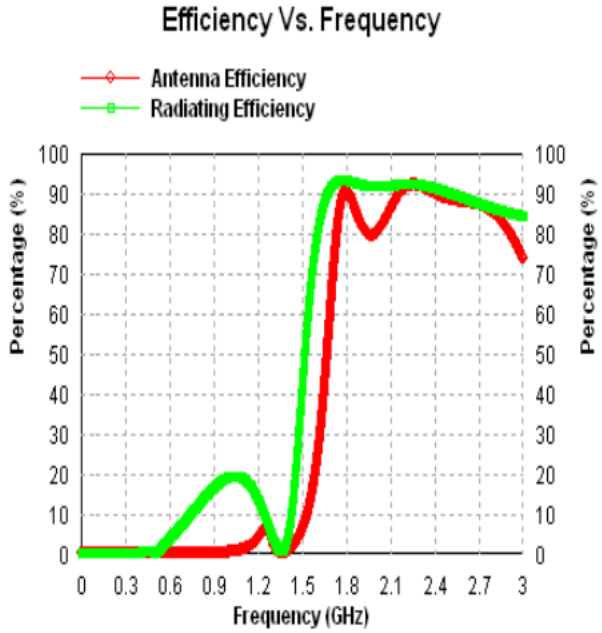

Fig. 10: Antenna and radiation efficiency vs Frequency

Since the feed point connected with the coaxial connector, have good equal amplitude and 180° phase shift, broadband linearly polarized radiation can be achieved [7]. Then, by using the glass Epoxy substrate, much wider LP bandwidth can thus be obtained. The impedance matching of the antenna can be achieved by fine adjusting the feed point position, the distance between the radiating patch and the ground plane (1.6+.0026mm).

In this paper, a double aero shape irregular patch of broadband microstrip antenna with 2.5 GHz design. The antenna have an output by using IE3D and analyses the all characteristics. A Glass Epoxy substrate is used in the present proposed design, and impedance matching is obtained through the radiating patch. proposed antenna is able to achieve VSWR less than 2 and the return loss above the 10.db.

IV CONCLUSIONS

Characteristics of a design of proposed LP aero shape microstrip antenna have been analyzed. The proposed antenna is achieved a bandwidth of 40%. The broadband LP microstrip antenna is able to achieve for VSWR less than 2 and the return loss is -28dB.

REFERENCES

[1] C.A. Balanis, Antenna Theory and Design, John Wiley & Sons, 1997.

[2] Rezaul Azim, Ahmed Toaha Mobashsher, Mohammad Tariqul Islam and Norbahiah Misran, "Compact planar antenna for UWB applications," IEEE ICMMT, 2010

[3] Mohamaed Nabil Srifi, Symon K. Podilchak, Mohamed Essaaidi, and Yahia N. N. Antar, "A planar circular disc monopole antennas using compact impedence matching networks for ultra wide band (UWB) applications," IEEE Trans. Antennas Propag., pp. 782-785, 2009.

[4] S. Cumhur Basaran, "Dual wideband CPW fed split ring monopole antenna for WLAN applications," 177, 2010.

[5] Seyed M. R. Razavizadeh, and R. Fallahi, "Exponential shape microstrip fed planar monopole antenna for UWB applications," European Microwave Conference (EuMA), pp. 1523-1526, 2009

[6] Amnat Sompan, Somporn Sewattanapon,Chatree Mahatthanajatuphat and Prayoot Akkaraekthalin, "An elliptical dipole antenna with rectangular slot reflector for wideband applications,"IEEE ECTI, pp. 200-203, 2011.

[7] Ravindra Kumar Yadav, Jugul Kishor and Ram Lal Yadava, "Design of Hexagonal Patch Antenna for Mobile Wireless System," IEEE IJSTM, Vol. 2 Issue 4,IEEE Trans. Antennas Propag., vol.978, no. 1, pp. 174-December 2011.

[8] Xian-Ling Liang, Tayeb A. Denidni, Li-Na Zhang, Rong-Hong Jin, Jun-Ping Geng and Quan Yu , " Printed binomial curved slot antennas for wideband applications," IEEE Trans. Microwave theory and techniques, vol. 59, no. 4, pp. 1058-1065, 2011

[9] P. C. Sharma, Kuldip. C. Gupta. Analysis and optimized design of signal feed circularly polarized microstrip antennas. IEEE Trans on Antennas andPropagat, Vol.AP-31, No.6, 1983

[10] Kin-Lu Wong and Jian-Yi Wu. Single-feed small circularly polarized square microstrip antenna. Electron. Lett, Vol.33 No.22, 1997