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DESIGN OF S-SHAPED PATCH ANTENNAFOR DUAL BAND APPLICATION

[1]Rajbir Singh ,Damandeep Kaur[2]

1 ResearchScholor, Department of Electronics & Comnmunication Engineering,Golden College Of Engineering & Technology, Gurdaspur, Punjab, INDIA

2Assistant Professor, Department of Electronics & CommunicationEngineering,Golden College Of Engineering & Technology, Gurdaspur, Punjab, INDIA.

A B S T R A C T

In this papaer S-shaped antenna propose for dual band applications. This antenna consists of rectangular dimension having 11.9 mm×0.9 mm. To improve performance of rectangular patch it is modified into S- shaped by taken two slits. The S_{11}-49. 149db achieved and desirable VSWR observed at 11.5resonant frequency for design antenna. The design antenna analyzed & simulate on High frequency simulation.

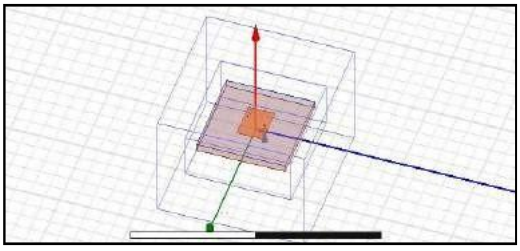
Keywords: Microstrip Patch Antenna, Compact

INTRODUCTION

Micro strip Patch Antenna: Recent day's wireless system widely use in the world. With the substantial enhancement in communications thedemand of compact design low cost, easy to fabricate dual band, multiband wideband used for commercial communication systems. A MSA consists of radiating patch on one side of dielectric substrates which has ground plane on other side. It is made up of conducting material. Micro strip radiates mainly due to cut- off field between the patch edge and the ground plane. Micro strip antenna is optimal choice for copius applications due low profile, light weight, low cost and ease of integration with microwave circuits. Standard rectangular patch antenna has the drawback of narrow bandwidth. The bandwidth ofmicro strip antenna may be increased using air substrate. However dielectric substrate must be used if pressed antenna size is required. By increasing substrate thicknessbandwidth can be enriched. The booming structure include E-shaped patch antennas, U slot patch antennas.[8]

OBJECTIVE

The objective of this paper to design miniature Shaped patch antenna for wireless applications especially for X Band applications. Design Rectangular micro strip slotted Patch antenna is based on the standard design procedure to find the length & width at resonant frequency .The two Rectangular cuts are included to disturb the surface current path, start local inductive effect which produces resonance in antenna. The slot dimensions of antenna are Length =4mm & width 0.5 mm. The dimension of patch is 11.9mm×9mm used for S-shaped rectangular micro strip antenna design. The substrate is taken as RT/duroid5880(tm) relative permittivity 2.2& patch is taken as copper .having relative permittivity 1[3]



* Corresponding author. Tel.: +919779445047
E-mail address: l u c k s i n g h 5 9 3 9 @ g m a i l . c o m

METHODOLOGY

In this paper latest research work is describe for S- Shaped antenna which is based on literature survey that describe different patch techniques. The research papers overview give strategy to work on patch dimensions, & different probe feeding method to enhance the existing performance of rectangular patch. In our research work our far most desire to minimize shape of S-shaped antenna to meet the desire specifications. The main parameters variation occur depends upon material chosen for patch & substrate .by increasing width & height of slot we can increase the performance characteristics of new proposed antenna.. The above methodology implement in high frequency simulated software for premium research application. The study view from the references we built in a new design antenna. [3] [4].The higher value of permittivity of substrate allow shrinking of patch antenna Its low dielectric constant, low loss tangent and low cost make it primary picking material for microwave substrate. The figure below show various terminologies associated with probe Fed.Micro strip antennas can also be fed by different technique one of technique shown in fig 4.1. The outer conductor of the coaxial cable is connected to the groundplane, and the center conductor is extended up to thepatch antenna The position of the feed can be altered as before (to control the input impedance. The coaxial feed introduces an inductance into the feed that may need to be taken into account if the height *h* gets large.[1] In our design procedure we taken dimension of 30×30 mm^2 and dimensions of patch are 11.9×9mm. In our design procedure we taken dimension of 30×30 mm^2 and dimensions of patch are 11.9×9mm. procedure we taken dimension of 30×30 mm^2 and dimensions of patch are 11.9×9mm. The material chosen for substrate Roger RT/duroid5880(tm) relative permittivity 2.2 & patch material having relative permittivity 1 to meet desired result after simulation. The dimension of slot in rectangular patch taken as L=4mm & W=0.5mm. The design antenna simulate on HFSS [9-11]

EXPERIMENTAL RESULTS

Simulation results S-Shaped antenna using ANASOFTHFSS version 14.0

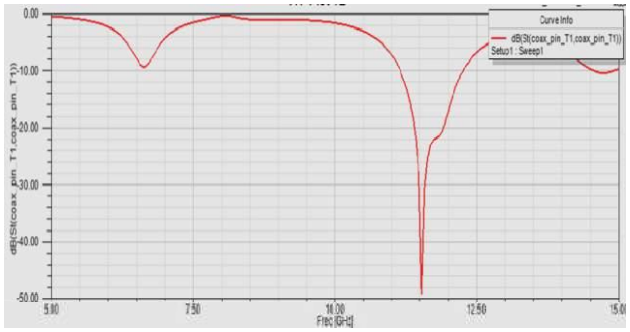


Fig. 5.1: Return Loss Graph

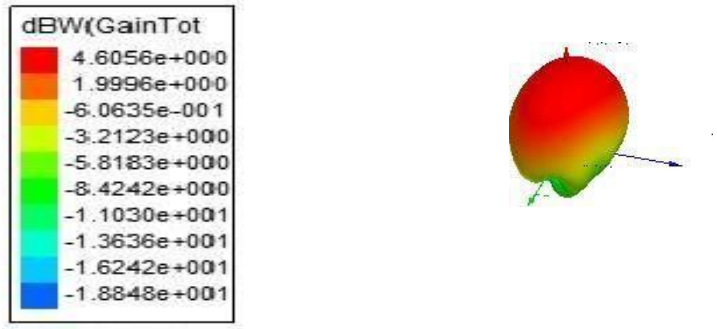


Fig. 5.4 3 D Polar Plot

The above experimental result after simulation on Ana soft HFSS describe the 3D gain plot in which dark area represent max values of radiation intensity .The pattern shows that antenna radiates good in broad dimension along upward direction. The return loss graph representing minimum

return loss value at -49.149 db frequency which means antenna resonance condition at this point. The high return loss value also shows a close Impedance match. Observing VSWR Pattern all values in graph at different frequency range lie between 0 &1.

CONCLUSION

An S-Shaped patched anteena for wireless application has prposed. It Shown good resonance at frequency 11.532 GHz . The desin antenna useful in radar system. The design antenna has gain at impedance real value 50. The future modification can be done in design by varying the slit position and feeding technique.

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