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REVIEW ARTICLE

ANALYSIS OF MICRO-STRIP PATCH ANTENNA FOR WI-FI APPLICATIONS

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ABSTRACT

For the purposes of Wi-Fi applications, the objective of this Rectangular Micro-Strip Patch antenna design. The aim of this research paper is to design, simulate, test and analyses a new form of rectangular micro-strip patch antenna with both RT Duroid and two-feed line substrates. The proposed model consists of the Linear Polarization Moment Process. The latest concept analytical analysis is simulation using the HFSS tool and the ZNB20 vector network analyzer (VNA) is used for experimental validation.

KEYWORDS

Linear Polarization (LP), RT Duroid, Wireless Network (Wi-Fi), MOM (Method of Moments).

1. INTRODUCTION

Wi-Fi technology allows its users the right to connect from any location such as their home, workplace or public place to the Internet without the hassles of plugging in the wires, at least by now you should be very conscious of that. It is easier for accessing information over a wide network than the traditional modem (Babu et al., 2012; Balanis, 1997). Users can easily adjust their location without interrupting their network access with the help of various amplifiers. Wi-Fi activated devices are compatible with each other in order to provide the user with effective access to information. Wi-Fi is a Wi-Fi hotspot where users can connect to a wireless network (Hammerstad, 1975; James and Hall, 1985). Users can also boost their home business via the Wi-Fi hotspot, as it's easy to access data through Wi-Fi. In some cases, it is cost-free to access a wireless network (Wi-Fi) via a hotspot, although in some it can bring extra costs (Madhav et al., 2012). Express Card, many common Wi-Fi chips such as PCI, mini-PCI, USB, Cardbus and PC card, make the Wi-Fi experience easy and enjoyable for users. These small devices are common plug and play and can be easily used if Wi-Fi is not installed on your computer (Phani et al., 2015). But now every single thing comes with Wi-Fi, including tablets and low-end mobile phones.

2. DESIGN AND ANALYSIS OF PROPOSED ANTENNA FOR WI-FI

The proposed antenna is the rectangular Micro-strip patch antenna and after theoretical calculation for the rectangular Micro-strip patch antenna the optimization technique is used for the desired output (Phani et al., 2016). To fulfill, our application, of the designing of the Micro-strip patch an approach to design and optimization of WLAN patch antennas for Wi-Fi

these are: a. Two-Line fed rectangular micro-strip patch antenna b. Inset fed rectangular micro-strip patch antenna (Phani et al., 2016).

2.1 Micro-strip Patch Antennas

A Micro-strip patch antenna is a thin square patch on one side of a dielectric substrate and the other side having a plane to the ground. The patch in the antenna is made of a conducting material Cu (Copper) or Au (Gold) and this can be in any shape, rectangular, circular, triangular, and elliptical or some other common shape (Phani et al., 2013). The basic antenna element is a strip conductor of length L and width W on a dielectric substrate with constant thickness or height of the patch being h with a height and thickness t is supported by a ground plane (Pulipati and Srinivas, 2013). The rectangular patch antenna is designed so as it can operate at the resonance frequency. The length that is for the patch does depend on the height, width of the patch and the dielectric substrate.

2.2 Geometrical configuration of Rectangular Micro strip Antenna

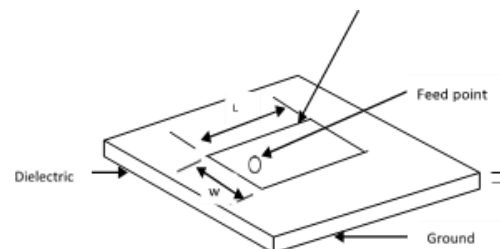


Figure 1: Dimensions of the Rectangular Patch

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The dimensions, bandwidth and gain of the microstrip patch antenna are determined by the operating frequency of the antenna, the relative dielectric constant, and thickness of the substrate material.

3. RESULTS AND ANALYSIS

The Following results are obtained with an Innovative and Creative Design of Rectangular Shaped Micro-Strip Patch antenna by the Proper selection of Dimensions such as Length and Width of the Radiating Patch, Proper thickness of the substrate, Clear Geometry of the Ground Plane, Proper Boundaries, Excitations of the rectangular Wave Guide and also Permittivity of the substrate is also important thing in the Design consideration (Richards et al., 1985).

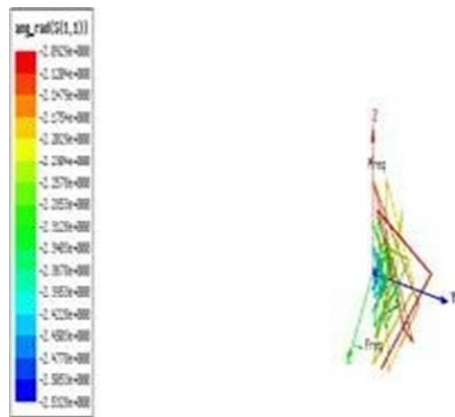


Figure 1: Rectangular Micro-Strip Patch antenna 3D Polar Plot

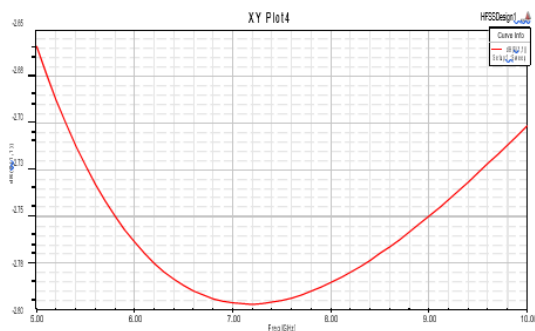


Figure 2: Shows the antenna 3-dimensional radiation pattern

4. CONCLUSION

The proposed inset feed rectangular patch antenna is a more conventional approach for the implementation of a Wi-Fi application and it's a good choice to replace commercially available Dipole antenna. Initially, edge feed rectangular micro-strip patch antenna is designed to operate at frequency 7.5 GHz. And then, the Two-Line feed rectangular micro-strip antenna is designed to resonate at frequency range 7.5 GHz. The proposed

antenna design optimization done with a standard electromagnetic simulator (HFSS). The accuracy, robustness and ease of fabrication of purposed antenna validate its potential application in Wi-Fi systems.

FUTURE WORK BASED ON THIS RESEARCH

Based on gathered observations while completing this paper; topics were identified which would benefit for further investigation. Using the variation in Two- feed length introducing the slots in this patch and also Defected Ground Structure to develop the New Research concept at Ku-Band.

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