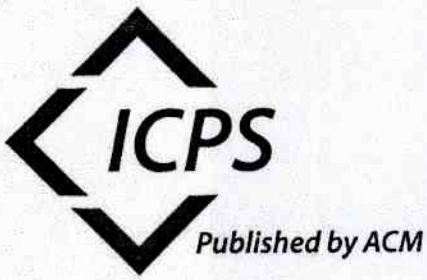
7th International Conference

on

Computer and Communication Technology

(ICCCT - 2017)

24 – 26 November, 2017



Organized by

Department of Computer Science and Engineering

Motilal Nehru National Institute of Technology

In Academic Collaboration with

SP Memorial Institute of Technology

Allahabad (UP) India - 211004

Table of Contents

DESIGN & ANALYSIS OF CIRCULAR PATCH ANTENNA FOR Ku-BAND APPLICATIONS

[1]Yashika Saini, [2]Harshal Nigam
[1,2]Assistant Professor, Electronics and Communication Engineering department
[1]Rajasthan Institute of Engineering and Technology, [2]Swami Keshvanand Institute of Technology, Jaipur, Rajasthan, India.

Abstract: **In this paper a circular microstrip antenna is designed for Ku band application. The design consists of a Circular patch having elliptical slot with defected ground substrate. It is observed through analysis that dimensions & slots are key factor for improving the bandwidth of this geometry. The antenna is fabricated on FR4 Substrate & S-parameters are optimized.**

Index Terms: **Circular Antenna, Defected ground, Elliptical slot, Ku band, Microstrip.**

I. INTRODUCTION

Microstrip antennas is most widely used in recent wireless communications devices because of some advantageous features such as small size and light weight, cost effective, compact and planner structure, easy interconnection with solid-state devices. Recently, frequency reconfiguration has attracted significant attention due to the introduction of future wireless communication concept such as cognitive radio which employs wideband sensing and reconfigurable narrowband communication [1]. Frequency reconfigurable antennas have the potential to reduce the size of front end system and allow pre-filtering at the receiver. Thus, it can support many wireless applications in one single terminal system [2].Many techniques have been proposed Such as stacked patches, etc. Recently a new technique of defected ground structure (DGS) is being used to enhance the bandwidth of microstrip antennas. In DGS intentional defects are introduced in the ground plane or slots of different shapes are cut in the ground that give rise to size reduction and desired radiation performance.

II. PROPOSED ANTENNA DESIGN

In the present work, an antenna is designed for a frequency of around 13 GHz that is in the Ku band. The proposed antenna consists of an elliptically slotted patch with a defected ground structure. The antenna has a compact size of 30X30 mm having a circular patch having 20 mm diameter as shown in Fig.1. It is fed by a 50 ohms microstrip line. The antenna is printed on FR4 substrate having a thickness of 1.59 mm. Further an elliptical slot is cut on the patch having 4 mm and 3 mm as major and minor axis respectively as shown in Fig.2. Now the ground plane is truncated to get a DGS structure as shown in Fig.3. The dimensions of the ground plane are 30X19 mm. DGS is now widely used to enhance the performance of microstrip antenna [3]. DGS often used for size reduction. The ground width is varied to get a DGS structure [4-5].

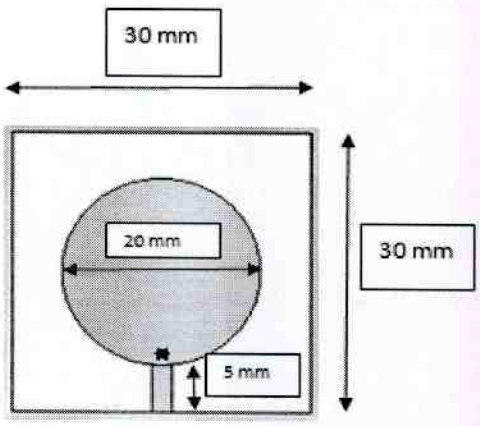


Fig.1. Top view of proposed antenna having circular patch.