PERFORMANCE EVALUATION OF 2×2 PLANAR ARRAYS RECTANGULAR COMPARED TO 2×2 PLANAR ARRAY CIRCULAR MICROSTRIP PATCH ANTENNA

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ABSTRACT

This paper discovers the performance evaluation 2×2 planar array rectangular compared to 2×2 planar array circular microstrip patch antenna. In this study, the 2 × 2 planar array rectangular microstrip patch antenna is named as structure 1 and 2 × 2 planar array circular microstrip patch antenna is named as structure 2. The study concentrates on frequency of 5.8GHz in reference to the Wimax characteristics. The antennas have been designed use by Flame Retardant 4 (FR-4). It has been simulated using Computer Simulation Technology (CST) Microwave Studio in CST2009 software. Return loss (S_{11}), Voltage Standing Wave Ratio (VSWR) and Gain (Ghz) values were obtained from simulations of the both antennas and were compared. The best performance for Return loss (S_{11}), Voltage Standing Wave Ratio (VSWR) and Gain (Ghz) out of both antenna types were concluded. Structure 1 antenna gave better results in comparison to the structure 2 antenna, which is reversed from the theory.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter, the background of the project is briefly discussed to provide an overview of the overall project. General information related to the design is also included, to give an insight of radio frequency design.

Microstrip antenna technology began its rapid development in the late 1970s. By the early 1980s basic microstrip antenna elements and arrays were fairly well establish in term of design and modeling [1]. In the last decades printed antennas have been largely studied due to their advantages over other radiating systems, such as light weight, reduced size, low cost, conformability and possibility of integration with active devices.

1.2 Background of Project

A microstrip patch antenna consists of a very thin metallic patch placed a small fraction of a wavelength above a conducting ground-plane. The patch and ground-plane are separated by a dielectric. The patch conductor is normally copper and can be in the form of any shape, but simple geometries generally are used, and this simplifies the analysis and performance prediction. The patches are usually photoetched on the dielectric substrate. The substrate is usually non-magnetic. I have used the FR-4 substrate in my project. The relative permittivity of this substrate is normally in the region between 4.5 and 4.9, which enhances the fringing fields that account for radiation, but higher values may be used in special circumstances.

Due to its simple geometry, the halfwave rectangular and circular patches are the most commonly used microstrip antennas. It is characterized by its length, L, width, w, radius, r and thickness h.