PLANAR DUAL MONOPOLES FOR CONTACTLESS LOW POWER TRANSFER

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ABSTRACT

A design of two planar dual monopoles combination is presented to study the feasibility in transferring low power signal wirelessly within a very short distance. Two identical sets of dual monopoles having circular form, and placed on top of each other, are used for transmitting and receiving. The operation frequency is chosen to be centered around 2.5 GHz, to ensure small dimensions of the overall circuit. The proposed configuration is designed and simulated using Computer Simulation Technology (CST), and realized using microstrip technology on FR4 substrate of 4.3 dielectric constant, and of 1.6 mm thickness. Vector Network Analyzer (VNA) was used to measure all the parameters of the antenna such as return loss, insertion loss and VSWR.

From the simulated and measured insertion and return loss, it is shown that the power transmission using proposed configuration can be achieved around the targeted frequency of 2.5GHz, where the S_{11} is smaller than -10 dB. Modifying the length of the monopoles can modify the frequency of transfer. The proposed antenna was very compact in size and the measured and simulated values of the parameters of the antenna concur well

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND STUDY

An antenna was defined by the IEEE as a means for radiating or receiving radio waves while Webster's definition as usually metallic device such as rod or wire for radiating or receiving elements [1]. In the other words, an antenna is a device for converting electromagnetic radiation in space into electrical currents in conductors or vice-versa, depending on whether it is being used for receiving or for transmitting respectively.

The progression of modern wireless communications has been increasing dramatically and hence the demand for antennas. These devices become smaller and lightweight. Microstrip antenna can meet these requirements due to their characteristics such as lightweight, easy to fabricate and have low profile. Moreover, they are low cost and can easily integrated into arrays or into microwave printed circuit [2].

Due to effects of the evolution in modern wireless communication systems and increasing of other wireless applications that required wider bandwidth, multiband operation and low profile has initiated antenna research in various.