PROXIMITY COUPLED FEED MICROSTRIP ANTENNA WITH DIFFERENT SHAPE OF DGS

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ABSTRACT

This thesis presents an analysis and designing the proximity coupled feed microstrip antenna with different shape of DGS. Various shapes were designed such as H-shape, E-shape, double dumbbells shape and four slots under the transmission line. The performance parameters of these shapes are compared to get the best results. The best design among these shape are four slots shapes. Four slots structure were design at ground below the feed line and this simulated antenna operating at 2.4GHz resonant frequency. The software used to simulate the patch antenna is Computer Simulation Tools (CST) Microwave Environment. This antenna is fed by a 50 Ω single microstrip line feeding with width 1.15 mm. In this thesis, the effects of antenna parameters like the frequency, return loss, voltage standing wave ratio (VSWR) and gain (dB) will study by using proximity coupler fed technique. The construction of the antenna consists of the microstrip feed line on a substrate proximity coupled to a single rectangular microstrip patch etched in top of surface. The dielectric constant of antenna is 4.7, the tangent loss 0.019 and thickness of the antenna is 0.8 mm. The proximity coupled antenna is measured using Vector Network Analyzer (VNA). Both the simulation and experimental results are compared and analyzed.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Nowadays, a microstrip antenna (often called patch antennas) is increasingly important in wireless communication systems because their simplicity and compatibility with printed-circuit technology. It is easy to easy to manufacture the microstrip antenna either as stand-alone elements or as elements of arrays. Their shape usually consists of rectangular or circular patch on top of grounded substrate [1]. The microstrip patch antenna is a type of antenna that used to process the signals with ultra-high frequencies. This microstrip patch antenna frequently used in the cell phone receiver or satellite radio and often mounted on the exterior of spacecraft and aircraft.

In addition, the rapid development of microstrip antenna begin at 1972 as the microstrip antenna has been introduced first by Munson in a symposium paper and followed by Howell two years later that discussed the rectangular patch antenna in another symposium paper [1].

Other than that, the advantages of the microstrip antenna are low profile, small and lightweight, easily conformable to non-planar surfaces, easy and inexpensive to manufacture in large quantities and it is mechanically robust [2].