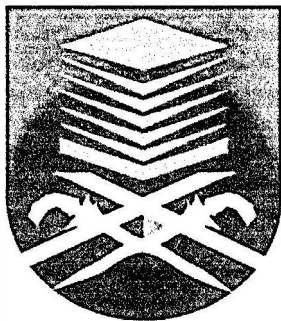


**SIERPINSKI CARPET FRACTAL ANTENNA WITH CIRCULAR
RING SHAPED DEFECTED GROUND STRUCTURE (DGS)**

**This thesis is presented in partial fulfilment for the award of the Bachelor of
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ABSTRACT

This work presents the design, simulation and fabrication of a Sierpinski carpet fractal antenna with circular ring shaped defected ground structure (DGS). The proposed antenna was designed and simulated at the centre frequency of 5.8 GHz and fabricated on Rogers RT/Duroid 5880 substrate with relative permittivity, ϵ_r of 2.2, substrate thickness, h of 0.38 mm and copper thickness, t of 0.017 mm. Computer Simulation Technology (CST) software was used in designing and simulation. Measurements of the parameters of the antenna were carried out by using Vector Network Analyzer (VNA). The antenna was designed with a circular ring shaped DGS. The performance of the antenna was improved through the implementation of the circular ring shaped DGS. Performance of the antenna was discussed in term of return loss (S_{11}), voltage standing wave ratio (VSWR) and radiation pattern.

The performance of the antenna was evaluated for various iteration of the Sierpinski carpet fractal antenna with DGS and without DGS. The results from the simulation and measurement was compared and discussed. The measurement result for center frequency was 5.82 GHz and the return loss was 27.323 dB. Both the measured and simulated values concur well and satisfied the specification. The antenna has achieved unidirectional pattern and can be used for RFID application.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Antenna is defined as a mean for radiating or receiving radio waves.[1] It can convert radio frequency waves (RF) into altering current and vice versa. It enable wireless communications between two or more stations by directing signals toward the stations. A typical antenna consist of metal conductor where the transmission line is either a coaxial line or a waveguide. [2] The antenna itself has improves modern wireless communication systems and at the same time the demand for antennas have increase dramatically.

Microstrip antenna is the simplest configuration of an antenna that can be printed directly onto a circuit board. It consists of a radiating patch on one side of a dielectric substrate which has a ground plane on the other side. The study of microstrip patch antennas has made great progress in recent years. Compared with conventional antennas, microstrip patch antennas have more advantages and better prospects. They are lighter in weight, low volume, low cost, low profile, smaller in dimension and ease of fabrication and conformity.[3] It can provide dual and circular polarizations, dual-frequency operation, frequency agility, broad band-width, feed line flexibility, beam scanning omnidirectional patterning. [3]