

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

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Peace and blessings of Allah be upon Prophet Muhammad.*

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ABSTRACT

This work presents the design, simulation and fabrication of a Sierpinski carpet fractal antenna with circular 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 0.381 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 shaped DGS. The performance of the antenna was improved through the position of the circular shaped DGS. Performance of the antenna was discussed in term of return loss (S_{11}), voltage standing wave ratio (VSWR) and radiation pattern.

This work was discussed of performance of the fractal antenna which was to see the comparison between different number of iterations and second discussion was done with the implementation of DGS and without DGS. The results from the simulation and measurement was compared and discussed. The measurement result for center frequency was 5.74 GHz and the return loss was 49.094 dB. Both the measured and simulated values concur well and satisfied the specification. The antenna has achieved unidirectional pattern and at the same time reduced in size and dimension. The antenna can be used for RFID application.

TABLE OF CONTENT

CHAPTER	TITLE	PAGE
	TITLE	
	APPROVAL	
	DECLARATION	ii
	DEDICATION	iii
	ACKNOWLEDGEMENT	iv
	ABSTRACT	v
	TABLE OF CONTENT	vi
	LIST OF FIGURE	ix
	LIST OF TABLE	xi
	LIST OF ABBREVIATIONS	xii
	LIST OF EQUATIONS	xiv
1.0	INTRODUCTION	1
	1.1 INTRODUCTION	1
	1.2 PROBLEM STATEMENT	3
	1.3 OBJECTIVES	3
	1.5 SCOPE OF WORK	3
	1.6 THESIS OUTLINE	4
2.0	LITERATURE REVIEW	6
	2.1 INTRODUCTION TO ANTENNA	6
	2.1.1 Microstrip Antenna	6
	2.1.2 Fractal Antenna	8
	2.1.3 Sierpinski carpet fractal antenna	11
	2.1.4 Defected ground structure (DGS)	11
	2.2 ANTENNA PROPERTIES	12
	2.2.1 Input Impedance	12
	2.2.2. Voltage Standing Wave Ratio (VSWR)	13
	2.2.3 Return Loss	13
	2.2.4 Gain	13

2.2.5	Radiation Pattern	14
2.3	FEED TECHNIQUES	16
2.3.1	Microstrip feed line	16
3.0	METHODOLOGY	17
3.1	INTRODUCTION	17
3.2	ANTENNA SPECIFICATION	17
3.3	FLOW CHART	18
3.4	SIERPINSKI CARPET FRACTAL ANTENNA DESIGN	20
3.5	ANTENNA CONFIGURATIONS	22
3.6	MICROSTRIP INSERT FEED	26
3.7	DESIGNING SIERPINSKI CARPET FRACTAL ANTENNA WITH DGS USING CST MICROWAVE STUDIO®	28
3.7.1	Conventional antenna	28
3.7.2	Sierpinski Fractal Carpet Antenna with First iteration	29
3.7.3	Sierpinski Fractal Carpet Antenna with Second iteration	30
3.7.4	Sierpinski Fractal Carpet Antenna with Second iteration With DGS	31
3.8	SIMULATION PROCESS	32
3.8.1	Waveguide Ports	32
3.8.3	Frequency Range	33
3.8.4	Field Monitors	34
3.8.5	Transient Solver	35
3.9	PROTOTYPE ANTENNA	36
3.10	MEASUREMENT OF PROTOTYPE ANTENNA	36
3.10.1	Vector Network Analyzer (VNA)	36
4.0	RESULTS AND DISCUSSION	38
4.1	INTRODUCTION	38
4.2	RESULT	38
4.2.1	Antenna dimension	39