

CONTENTS

AGREEMENT PAGE

ORIGINALITY STATEMENTS

ABSTRACT **iv**

GRATITUDE NOTE **v**

Contents **vi**

List of Figures **viii**

List of Tables **x**

1 INTRODUCTION **1**

- 1.1 Introduction 1
- 1.2 Problem Identification 2
- 1.3 Objectives and Contribution 2
- 1.4 Scope of The Thesis 3
- 1.5 Research Method 3
- 1.6 Book Structure 4

2 BASIC CONCEPT **5**

- 2.1 Antenna 5
 - 2.1.1 Rectangular Microstrip Patch Antenna 5
 - 2.1.2 Feed Line 9
- 2.2 Dual-Band 10
- 2.3 Antenna Directivity 11
- 2.4 Radiation Pattern 11
- 2.5 Gain 11
- 2.6 VSWR 11
- 2.7 Bandwidth 13

3 PROPOSED MODEL OF ANTENNA **14**

- 3.1 Flowchart of Antenna Design 14

3.2	The Specification of Initial Antenna Design	15
3.3	Antenna Design and Target	15
3.3.1	6 GHz Frequency Patches	16
3.3.2	6 GHz Feed Line Design	17
3.3.3	2.4 GHz Frequency Patches	18
3.3.4	2.4 GHz Feed Line Design	19
3.3.5	Main Feed Line	20
3.3.6	Ground Plane and Substrate	20
3.4	Simulation with 3D model simulation software	21
3.4.1	Initial Antenna Design and Antenna Iteration	21
3.4.2	Antenna Iteration 1	23
3.4.3	Antenna Iteration 2	25
3.4.4	Final Antenna Iteration	26
3.5	Antenna Realization	27
4	RESULTS AND ANALYSIS	28
4.1	Antenna Measurement	28
4.2	Result And Analysis in 3D model simulation software	28
4.2.1	VSWR	28
4.2.2	Bandwidth	29
4.2.3	Gain	30
4.2.4	Antenna Directivity and Radiation Pattern	31
4.3	Antenna Measurement in Lab	35
4.3.1	VSWR Measurement	36
4.3.2	Radiation Pattern Measurement	37
4.4	Comparison of Measurement in Antenna Lab and Simulation Results	39
4.4.1	Comparison between VSWR	40
4.4.2	Comparison between Azimuth radiation pattern	41
5	CONCLUSIONS AND SUGGESTION	43
5.1	Conclusion	43
5.2	Suggestion	43

Bibliography

APPENDIX