INVESTIGATION ON PARASITIC SEMICONDUCTOR ON MICROSTRIP PATCH ANTENNA OPERATE AT 2.4 GHz

This thesis is presented in partial fulfilment for the award of the Bachelor of Engineering Electronic (Communication) with honours.

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16 JANUARY 2014

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ACKNOWLEDGEMENT

In the name of Allah, the Most Mightiest and the Most Gracious, Lord of Universe who has given me the strength and blessing throughout the entire time and to complete this project and report. Peace and blessings of Allah be upon Prophet Muhammad S.A.W.

First of all, I would like to express my gratitude to Almighty God for giving the guidance and strength in making this works a success. I would like to express my sincerest gratitude to those who helped in navigating this long and fruitful journey.

I would like to express my sincerest thanks to my project supervisor, Pn Suhaila binti Subahir for the guidance, valuable advices, great ideas and continuous supports throughout the preparation the project and until the thesis is complete. Besides, I would like to express my special thanks to En. Mohd Khalim, Research Officer from Microwave Technology Center (MTC) for usage of test and equipment to complete this work.

Nevertheless, my special thanks also to my family for giving a never ending supports, encouragement, advices and guidance to complete this research, their love and care have brought to this level.

Last but not least, I would like to express my heartfelt thanks to all my friends for the support and encouragement to complete this project.

ABSTRACT

The design of a rectangular microstrip patch antenna covered with semiconductor material operating at 2.4 GHz for wi-fi application is presented. This paper investigates the semiconductor effect to microstrip patch antenna based on the variety of thicknesses and type semiconductor. The semiconductor material used in this paper such as GaAs, AlGaAs, InGaAs with having difference permittivity.Permittivity for each semiconductor material is difference will indicates a material can become polarized by imposition of an electric field on an insulator (substrate antenna). The antenna are optimized using Computer Simulation Technology (CST) at 2.4 GHz frequency, the antenna will fabricated on FR4 with relative permittivity of 4.8, the substrate thickness is 1.6mm and the copper thickness is 0.035mm respectively. The results of return loss (S_{11}) are gathered and compared based on difference semiconductor material and thickness.

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CHAPTER 1

INTRODUCTION

This chapter consists of a problem statement, objective and outline of my thesis. This section highlighted the important of the project and the arrangement of this thesis.

1.1 INTRODUCTION

Antenna is one of the main elements in the RF system for transmitting or receiving signals from and into the air as medium. Without proper design of the antenna, the signal generated by the RF system will not be transmitted and no signal can be detected at the receiver. Antenna design is an active field in communication for future development. Many types of antenna have been designed to suit with most devices. One of the types of antenna is the Microstrip Patch Antenna (MPA). The idea of microstrip antenna was first presented in year 1950s but it is only got serious attention in the 1970s [1].

Antenna also called an aerial, an antenna is a conductor that can transmit and receive signals such as radio, microwave or satellite signals. A high-gain antenna increases signal strength, where a low-gain antenna receives or transmits over a wide angle [2]. The effective antenna is where it can give the better performance based on an efficient radiation efficiency. [3]