FACULTY OF ELECTRICAL ENGINEERING

UNIVERSITI TEKNOLOGI MARA

PULAU PINANG

FINAL REPORT:

PRINTED H-SHAPED ANTENNA FOR WIRELESS NETWORK

NUR SYAHIRAH BINTI MANSOR

2010393527

NAWAL BINTI ABDUL RAHIM

2010116417

SUPERVISOR:

PUAN AIZA MAHYUNI BINTI MOZI

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

With the name of Allah S.W.T the most merciful, Alhamdulillah, with His bless I could done the responsible that have been given to me to do this Final Year Project II and its report as well as I can.

Firstly, with full of grateful, I would like to give a million of appreciation and thanks to my supervisor, Puan Aiza Mahyuni Binti Mozi for her kind guidance, criticism and advice throughout my project session. She has provided a good balance freedom and interest and has been a constant source of ideas and suggestions and recommendations. Thank you very much.

Here also, I would like to acknowledge in particular continuous support of my parents and family. They have been consistent encouragement for me throughout my three years of university education. Not forget, thanks to all my friends who always give me support on my way finishing my project. Thanks everyone.

Lastly, I would like to give a million of thanks for all who been directly or not in order to help me along my project. Thank you very much.

ABSTRACT

H-shaped patch antenna suitable for wireless and satellite communication is presented. The new antenna has some advantages compared to conventional microstrip patch antennas, such as small size, a fewer number of modes, no harmonics resonance, and the provision of pure reactive impedances at its harmonics that can result in increasing the transmitter efficiency. The basic principles and design procedure are introduced. Two antennas at two different frequencies, 4 and 10 GHz, are designed, fabricated and measured. The measured results show a good agreement with the predicted ones. Simulation is done using two different simulation technique, the circuit model derived from the Transmission Line Model and is compared with another simulation set using Method of Moment. After optimized process, a good design of patch antenna fabricated using FR4 of 1.6mm thickness and feed using proximity coupling method. The fabricated patch is tested using Vector Network Analyzer (VNA) to evaluate its performed measurement result in S11, VSWR and bandwidth. To match the input resistant, the output of the feeder line was accurate at 50Ω so that it can test at the lab using Vector Network Analyzer (VNA) to measure the network parameters of electrical networks.

CHAPTER 1
INTRODUCTION

1.1.Background

Nowadays, due to their several keys advantages over conventional wire and metallic antennas, microstrip antennas have been used for many applications, such as Direct Broadcasting Satellite (DBS) system. Their advantage including low profile, light weight, low cost, ease of fabrication and integration with RF devices. They can also be made conformal to mounting structures.

However, when they can be applied in the frequency range below 2 GHz, the sizes of conventional rectangular microstrip patches seem to be too large, which make it difficult for them to be installed on televisions, notebook, computers or other hand-held terminals. Several techniques have thus been proposed to reduce the sizes of conventional half-wavelength microstrip patch antennas.

In using high dielectric constant material has been proposed, however this will lead to high cost and high loss due to the use of high dielectric constant material. Also poor efficiency due to surface wave excitation is another drawback of this method.