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PROJECT PROPOSAL FOR FINAL YEAR PROJECT 2
(EEE690)

Part A : To be filled by student and project supervisor

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PROJECT TITLE :

THE DESIGN AND SIMULATION OF RADIO RECEIVER AT THE
FREQUENCY OF 2.4G Hz.

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Bismillah (In the name of Allah),

I would like to express my highest gratitude to Allah s.w.t for His blessings I am able to further my studies in this field. It has been due to His wisdom that I have learned so much throughout the duration of my studies. I always believe that everything happens for a reason and it is my task to find the reason and always learn from it. As everything is His knowledge, it is to Him I should submit after all the effort that I put onto my studies.

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To my supervisor, Puan Hanunah Othman, I would to thank her for her guidance and trust towards me throughout the process of completing this final year project. My appreciation is also to all the people that have been involved in this project in any possible ways.

ABSTRACT

This project is about designing and simulating a radio receiver system that operates at the frequency of 2.4G Hz. To make the radio receiver system, three components have to be designed which are antenna, filter and also amplifier. The design started with calculations and then the values were inserted into computer software using EESof Genesys. The initial circuits have to be simulated to view the performance and improvements to get the best circuits. All these three circuits are then combined to form a radio receiver that operates at the frequency of 2.4G Hz. For the hardware, the antenna was fabricated and tested using V.N.A machine. The results obtained then will be compared with the theoretical values for studies purposes. 2.4G Hz is high frequency and it is chosen because it is specified for Automatic Vehicle Identification (A.V.I) globally. This project will further enhance and can be used for many communication purposes.

PROJECT TARGET

To design the radio receiver that operate at the frequency of 2.4G Hz and hope it will be further developed for the use of public transport system. With further development, it can help to improve the public transportation by telling the users at all stations the whereabouts of the bus they are waiting. This will make them able to plan their journey hence increase the quality of life.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Radio frequency identification or RFID is a method of identification using the devices called RFID tags or transponders and RFID readers. The tags are capable of storing and retrieving data and usually incorporated into a product or human for the purpose of identification using radio wave.

1.2 RFID TAGS

RFID tags are divided into a few types which are passive tags, semi-passive tags and active tags. Passive tags require no internal power source while the semi-passive and active tags need power source for instance a battery.

1.2.1 Passive Tags

Passive tags have no internal power source, so when the radio wave arrives it will induce electrical current which is just enough to power up the tags and transmit response. The antenna of passive tags is designed to collect power from the incoming radio signal and transmit it through backscattering the signal. The practical read distance of passive tags are from 11 cm to 10 m. However, with the usage of phase array it can reach up to 183 m.

1.2.2 Semi-passive Tags

Semi-passive tags have their own power source but only to power up the microchip. Another function of the battery is to enhance the capability of the semi-passive tags to store data. To broadcast the data, semi-passive tags use backscattering method as like passive tags.