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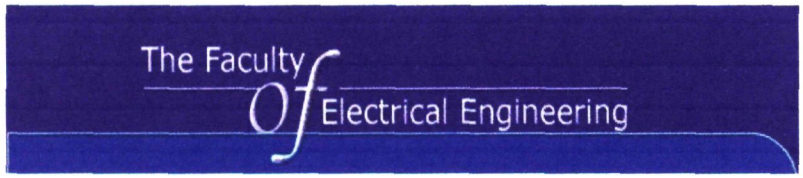

FINAL YEAR PROJECT

EEE 690

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ABSTRACT

The work highlights the design, development and fabrication of passive element for MMIC application. Different type of metals such as Aurum (Au), Platinum (Pt), and Copper (Cu) were used in the design to confer the basic characteristic of inductor (L) and resistor (R) that have been used in MMIC. The design of inductor (L) and resistor (R) were in a single turn meander inductor of 4nH and thin film resistor of 50 Ω respectively, based on microstrip theory in order to explore their performance. Analysis of the prototype using vector network analyzer of meander inductor showed that the used of various conductor strip does not affect the values of inductance. Miniaturization of the inductor and resistor were achieved with the used of high-k substrates.

CONTENTS

CHAPTER 1

INTRODUCTION

This chapter briefly presents the introduction of the work that is proposed. Some general information that related to this work was also included to provide some insight on the work.

1.1 Introduction to project

In electronics, an integrated circuit that is also known as IC, microcircuit, microchip, silicon chip, or chip is a miniaturized electronic circuit which consisting mainly of semiconductor devices, as well as passive components that has been manufactured in the surface of a thin substrate of semiconductor material. Integrated circuits are used in almost all electronic equipment in use today, it has revolutionized Monolithic microwaves integrated circuit concept such as MMIC.

Microwaves monolithic integrated circuit (MMIC) is a microwave circuit in which one or more discrete microwave devices are mounted on a substrate which consists of the active and passive circuit elements and associated interconnections formed either in site on or within a semi-insulating substrate, such as a semiconductor, or insulating substrate by one or more well known deposition processes. It is a type of integrated circuit (IC) devices that operate at microwave frequencies of 300 MHz to 300 GHz and typically perform functions such as microwave mixing, power amplification, low noise amplification, and high frequency switching. Inputs and outputs on MMIC devices are frequently matched to a characteristic impedance of 50 ohms. This makes them easier to use, as cascading of MMICs does not then require an external matching network. Additionally most microwave test equipment is designed to operate in a 50 ohm environment. In an MMIC, passive circuit elements such as resistors, inductors and capacitors are fabricated in monolithic form on a silicon substrate [1].