

**ON WAFER PROBING OF MONOLITHIC MICROWAVE
INTEGRATED CIRCUIT CAPACITORS**

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**NOR ASMAH BINTI AHMAD
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM
SELANGOR DARUL EHSAN
MALAYSIA**

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ABSTRACT

The purpose of this project is to measure capacitor on silicon wafer using Cascade's probe. The wafer will be measured using the RF probing technique. This project also will design the interdigital capacitor which focuses on the simulation with different length and width. The silicon has been used as a substrate with $\epsilon_r = 11.7$ and thickness=300 μm . The circuits were simulated using CAD packages.

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CHAPTER 1

INTRODUCTION

1.1 Objective of the project

The main objectives for this project are to measure and analyze the characteristics of capacitor on silicon (Si) wafer. The wafer will be measured using the RF probing technique, Cascade's Summit 9100 in conjunction with a *Vector network analyzer* (VNA). While Genesys *Computer aided design* (CAD) software will be used to model and design the capacitor. The silicon has been used as a substrate with $\epsilon_r = 11.7$ and thickness=300 μm . The characteristics to be simulated will focus on width of each conductor (W) and length of fingers (L). All the measurement and simulation in the frequency range of 0.2-20 GHz. The measurement and simulation results will focus on the reflection and transmission coefficients, S_{11} and S_{21} .

1.2 Scope of the project

This thesis consists of seven chapters. Each chapter discussed the details of the particular topic related to the probing capacitor on wafer of monolithic microwave integrated circuit. The contents of the first chapter covered the introduction of the project and methodology.

In chapter 2, brief explanation about *monolithic microwave integrated circuit* (MMIC) consist of meaning, history of MMIC technology, structure, performance, application and summary of MMIC.

Chapter 3 describe about theoretical aspects of monolithic capacitors. The content of this chapter include the introduction, type of capacitor and approximate analysis.

Chapter 4 covered the design and simulation of capacitor, *computer aided design* (CAD) are also included in this chapter.