# THE EFFECT OF ETCHING PROCESS OF NMOS STRUCTURE USING SILVACO TCAD TOOLS

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# ABSTRACT

The effect due to the etching process of NMOS structure using Silvaco TCAD tools software was investigated using different etching methods by varying the etch rate and divergence rate. The etching methods are isotropic wet etching method and isotropic RIE etching method where the length of polysilicon gate and threshold voltage were decreased by increasing the etch rate. The chemical RIE etching method provided highly selectivity and directionality gives various divergence rates. The directional RIE etching method gave similarities in term of etch profile, junction depth and threshold voltage characteristic compared to the reference geometrical etching method for any etch rate and divergence rate.

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# CHAPTER 1

# INTRODUCTION

This project uses Silvaco Technology Computer Aided Design (TCAD) tools software as a fabrication simulation process and device simulation tools. The first chapter of this report will discuss the project background underlying the etching process and the simulation process of N-type Metal Oxide Semiconductor Field Effect Transistor (N-MOSFET) in general. The objectives, significance of research, scope of work and thesis arrangement were also mentioned in this chapter.