

**A COMPARATIVE STUDY FOR VARIOUS STRUCTURES OF THE  
P-N JUNCTION ON SILICON (100) WAFER**

**MOHD GHASANI BIN MOHD MAIMI**

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in the Faculty of Applied Sciences  
Universiti Teknologi MARA**

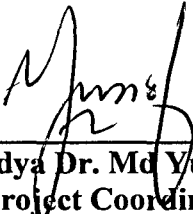
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This Final Year Project Report entitled “A Comparative Study for Various Structures of the P-N Junction on Silicon (100) Wafer” was submitted by Mohd Ghasani Bin Mohd Maimi, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Industrial Physics, in the Faculty of Applied Sciences, and was approved by

**FARAH LIYANA BINTI MUHAMMAD KHIR**  
B.Sc. (Hons.) Industrial Physics, USM  
M.Sc. (Physics), USM  
Physics Lecturer  
Universiti Teknologi MARA (UiTM), Shah Alam

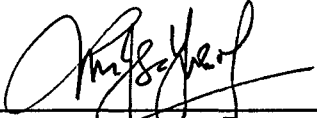
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**Farah Liyana Bt Muhammad Khir**  
Supervisors  
B. Sc. (Hons.) Industrial Physics  
Faculty of Applied Science  
Universiti Teknologi MARA  
40450 Shah Alam  
Selangor



---

**Prof. Madya Dr. Md Yusof Theeran**  
Project Coordinator  
B. Sc. (Hons.) Industrial Physics  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
40450 Shah Alam



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**Tn. Hj. Isa Bin Yusuf**  
Head of Programme  
B. Sc. (Hons.) Industrial Physics  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
40450 Shah Alam

Date: \_\_\_\_\_ 19 MAY 2011

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## ABSTRACT

### A COMPARATIVE STUDY FOR VARIOUS STRUCTURES OF THE P-N JUNCTION ON SILICON (100) WAFER

This project is to investigate the fabrication of p-n junction by using three different structures on silicon (100) wafer. A semiconductor diode is basically by made silicon material that has impurities added to it. This is to create a region on one side that contains negative charge carriers (electrons), known as n-type semiconductor, and a region on the other side that contains positive charge carriers (holes), known as p-type semiconductor. The junction's terminal attached to each region. In this project, various structures are used to compare the p-n junction characteristics and behavior for each of them. The n-type silicon wafer with orientation of (100) is used to fabricate the junction. For the impurity to obtain p-type junction, Boron dopant is used in order to produce it. This project is important to investigate the method of fabrication by using different structures of p-n junction. The fabrication process included in this project is basic fabrication process but in this project, it will concentrate on different design of the structure part. 3 sets of designed masked is needed for this project created by using Turbocad software system. The instrument that would be used during the fabrication process are wet cleaning, oxidation, photolithography, pattern transfer, wet etching, spin on dopant, diffusion and metal deposition. For the characterization part, the 4 point probe and I-V measurement would be used to obtain the electrical characteristics of the junction.