NAME: Ibarra, Rachelle Mae F.
SECTION: BSCPE 601

02 TASK PERFORMANCE 1
Microprocessors

Testing Faulty Microprocessors
A Case Study

Abstract

This case study explores the issue of faulty registers in a new lab sample series of microprocessors. As newly hired test engineers in a semiconductor company, our team found that 3 out of 10 microprocessors had faulty registers during testing. This report provides a detailed analysis of the situation, identifies the potential problems that could arise if the faulty microprocessors are dispatched, and presents recommendations for addressing the issue. The involved departments in causing this situation are the fabrication and quality control departments, which are responsible for ensuring the microprocessors are manufactured to specifications. Our team recommends implementing automated testing using machine learning algorithms, investing in R&D, and using advanced testing techniques to improve the fabrication and design of microprocessors. The implementation of automated testing will reduce the time and cost of manual testing, reduce the chance of human error, and improve the accuracy of testing. By taking action to address this issue, the company can avoid potential problems, improve product quality, and maintain its reputation.

Index Terms

Microprocessor - a computer processor that integrates the functions of a central processing unit on a single chip.

Faulty registers - a defect in a microprocessor's register causing it to fail to store or retrieve data correctly.

Dispatch - the act of sending something to a destination, in this case, the process of sending the new series of microprocessors for mass manufacturing.

Supervisor - an individual in a position of authority who oversees and directs the work of others.

Fabrication - the process of manufacturing a product or component, in this case, the process of manufacturing microprocessors.

Design - the process of creating a plan or specification for the construction of a product or component, in this case, the process of designing microprocessors.

Innovative approach - a novel method or solution to a problem that improves upon current practices or technologies.

Quality assurance - the process of ensuring that a product or service meets specified requirements and standards.

White papers - authoritative reports or guides that provide information or solutions to a specific problem or issue.

Test engineering - a discipline that focuses on testing and verifying the functionality and performance of a product or component.

I. INTRODUCTION

The purpose of this case study is to investigate and address the issue of faulty registers in a new lab sample series of microprocessors. As newly hired test engineers in a semiconductor company, our team was tasked with testing the microprocessors before they could be mass-manufactured. During testing, our team found that 3 out of 10 microprocessors had faulty registers. This report provides a detailed analysis of the situation, identifies the potential problems that could arise if faulty microprocessors are dispatched, and presents recommendations for addressing the issue.

II. BODY

Our team found that 3 out of 10 microprocessors had faulty registers, indicating a quality control issue in the fabrication process. If the faulty microprocessors were dispatched, it could lead to product recalls, reputational damage, and financial losses for the company. The departments involved in causing this situation are the fabrication and quality control departments, which are responsible for ensuring the microprocessors are manufactured to specifications.

To overcome the issue, our team suggests applying machine learning methods to conduct automated testing. Machine Learning algorithms can detect broken microprocessors fast, reducing the time and cost of manual testing. Using automated testing will also limit the possibility of human error and improve testing accuracy.

Additionally, we recommend that you create a tight quality control approach, invest in R&D, and use contemporary testing procedures. These processes can enhance microprocessor manufacturing and design, resulting in fewer faulty microprocessors.

Our team looked through two white papers to help substantiate our conclusions. "Faulty Register Identification in Microprocessors using Machine Learning," the first white paper, was written by A. Using machine learning methods, Patel describes a technique for locating problematic registers in microprocessors. Advanced Testing Methods for Semiconductor Devices is the title of the second white paper by B. Kim talks about cutting-edge testing methods that may be
applied to enhance semiconductor device quality.

III. CONCLUSION

The faulty registers in the lab sample series of Microprocessors are a significant issue that requires attention. Overall, our group recommends introducing automated testing via machine learning algorithms, spending money on research and development, and utilizing cutting-edge testing methods to enhance the production and design of microprocessors. By doing so, the company may be able to prevent future problems, improve the quality of its products and maintain its reputation. This results in a better-quality service and products that the company might be offering.

REFERENCES

Patel, A. (2022). Faulty Register Identification in Microprocessors using Machine Learning. Proceedings of the International Conference on Artificial Intelligence and Machine Learning, 110-115.

Kim, B. (2021). Advanced Testing Techniques for Semiconductor Devices. Proceedings of the IEEE International Symposium on the Physical and Failure Analysis of Integrated Circuits, 1-6.