

DEVELOPMENT OF A LFCSP (LEAD FRAME CHIP SCALE PACKAGE)  
INTEGRATED CIRCUIT PADDLE SCRATCH REJECT VERIFIER

Design Project

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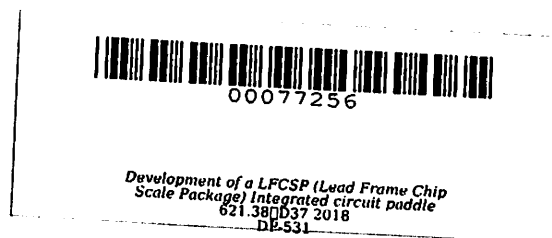
June 2018



# **DEVELOPMENT OF A LFCSP (LEAD FRAME CHIP SCALE PACKAGE) INTEGRATED CIRCUIT PADDLE SCRATCH REJECT VERIFIER**

Undergraduate Design Project  
Submitted to the Faculty of the  
College of Engineering and Information Technology  
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In partial fulfilment  
of the requirements for the degree  
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## **ABSTRACT**

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The general objective of the study was to design and develop an LFCSP (lead frame chip scale package) Scratch Reject Verifier. The design project was composed of the image acquisition device and the image processing software. The image processing software runs on MATLAB student version. A graphical user interface (GUI) was also developed to run the functions of the program conveniently. The device was pilot tested by the researchers at Engineering Science (ES) Building, College of Engineering and Information Technology (CEIT), Cavite State University (CvSU), Indang, Cavite and at Silang, Cavite and was evaluated at Analog Devices Inc. on April 2018. Based on the results of the evaluation, the project met the given objectives. The system has an accuracy of 95 percent in classifying sixty scratch reject samples as “good” or “reject” in a significantly lower average duration of 47.4 seconds than manual verification. The device results were further verified by the researchers through manual measurement of the scratches by using gridlines. The device was also able to prove its functionality, reliability, usability, learnability, consistency, perceptual limitation and usefulness through the evaluation of the back/ end process engineers.

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## **INTRODUCTION**

In semiconductor company, the cost of shipping reject products can significantly impact the company's revenues and profitability, because of potential returns, loss of customer and damaged reputation. Nowadays, as devices become more complex and continue to shrink in size. The defects also become more complex and shrink in size.

Manual verification of IC final product slows down the production process in semiconductor companies. The process mainly depends on the QA (quality assurance) personnel and varies from one QA to another. Image processing is now being used to solve wide variety of problems and its application in the industry became a trend.

Common problems encountered in semiconductor companies regarding IC fabrication are the scratches on the surface of the IC that is caused by various factors. The scratches in final products may not be suitable and acceptable for the customers.

Currently, in semiconductor manufacturing company, the IC scratch verification process is done manually. The QA operator usually decides if the scratches in the ICs may