THERMAL ANALYSIS OF A QFN PACKAGE WITH DIFFERENT EPOXY THICKNESS AND MATERIAL USING ANSYS

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UNIVERSITI TEKNOLOGI MARA

MOHD SYAFIQ BIN MOHD SAFIE
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM SELANGOR
MALAYSIA
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ABSTRACT

High performance and low temperature are important in designing a QFN package. This thesis discusses the design and analysis of a thermal effect based on the different epoxy thickness and material used. The different epoxy thickness combines the good features of the thermal resistance and rate of heat flow in a QFN package. The QFN package design is focusing on the minimization of the package size and the temperature itself, which will improves the QFN package performance. This thesis will discuss how this project experimenting the thickness and material used to obtain the low temperature and high performance QFN package. The simulation results have been obtained using thermal flux, heat flow, and temperature are applied on the die, for load 50°C, 100°C and 125°C, considering steady-state analysis without vary with time. The simulation results are derived using ANSYS 13.0 software, which resulted nodal temperature, thermal gradient, and thermal flux. The results show that the lowest epoxy thickness and the material that have higher thermal conductivity give the lowest result of a thermal effect compared to the higher thickness and lowest thermal conductivity of a material.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This thesis presents thermal analysis of quad flat no lead. The purpose of this project is to analyze thermal effect of QFN package with different epoxy thickness and different material for the epoxy as well as mold compound by using ANSYS software.

This project is carried out from one of the reason of QFN package failure that stated in technical paper of Thermal Analysis of a QFN Package. The steady state thermal analysis performed in this study includes the comparison of thermal effects for different material properties with various temperatures loading.