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# The Measurement of Thermal Stress in Plastic-Molded ICs by CCD Image Sensor

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In general, the IC is molded by epoxy resin. The molding process includes both heating and cooling processes. It has been reported that thermal stresses are generated in epoxy-molded ICs during these processes. The thermal stresses have adverse effects on IC function. For this reason, an analysis of thermal stresses in the epoxy-molded IC has been made. In this study, the photoelastic method was used for the analysis of thermal stresses. In the epoxy-molded IC, a CCD image sensor was used to take several images of the thermal stress, and the thermal stresses were then calculated with a personal computer.

## 1. Introduction

In general, the integrated circuit (referred to as the IC) is molded by epoxy resin. It has been reported that thermal stresses are generated in the epoxy-molded IC in the heating and cooling processes during molding, and converge at the interface between the IC chip and the epoxy resin molding.[(1)] As a result, the thermal stresses have adverse effects on the IC function. Therefore, an analysis of the thermal stresses in the epoxy-molded IC has been called for.

The purpose of this study is the measurement of the thermal stress using a com-