

MS Thesis Defense Announcement
Mechanical and Aerospace Engineering Department
University of Texas at Arlington

**IMPACT OF OIL IMMERSION ON THERMO-MECHANICAL
PROPERTIES OF PCB'S AND RELIABILITY OF ELECTRONIC
COMPONENTS**

By

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Abstract

Immersion cooling technique is used for the thermal management of high-density data centers to avoid overheating of components and failure of servers. However, to use this as a viable cooling technique, the effect of dielectric coolants on the reliability of server components needs to be evaluated. Previous work reports contradicting findings for Young's modulus of PCBs, providing motivation for this work. This study focuses on effect of immersion cooling on the thermo-mechanical properties of printed circuit board (PCB) and its impact on reliability of electronic packages. Changes in thermo-mechanical properties like Young's modulus (E), Glass transition temperature (T_g), Coefficient of thermal expansion (CTE) of PCB and its layers due to aging in dielectric coolant are studied. Two types of PCBs namely 370HR and 185HR are studied. To characterize Young's modulus and T_g dynamic mechanical analyzer (DMA) is used; while thermo-mechanical analyzer is used to characterize CTE. Major finding is Young's modulus is decreasing for PCBs after immersion in dielectric coolant which is likely to increase reliability of electronics package.