

The Reality of Pb-Free Reliability

1 Day Course

ABSTRACT

Although July 2006 has passed, the potential reliability implications of switching to Pb-free materials and a Pb-free process will potentially be felt for years to come. Numerous American companies in industries exempt from RoHS have already decided to make the jump to Pb-free. These include automotive, appliance, telecommunications, and military. These applications demand long-life in potentially severe operating environments. Understanding how to predict and ensure quality and longterm reliability is critical to customer satisfaction and, eventually, the success of your company.

This presentation provides a focused but comprehensive discussion on all potential issues that can arise during the transition to Pb-free. All areas of potential risk are examined. For each reliability concern, a brief description is provided, followed by the current state of industry knowledge and an opportunity for risk mitigation based upon the product design, materials, complexity, volumes, and customer expectations of reliability. A final summary provides the attendees a roadmap for ensuring the reliability of Pb-free product.

OUTLINE

- Introduction
 - Review of RoHS Legislation
 - What has Changed?
- Components
 - Robustness
 - Popcorning (PEMs and capacitors)
- Tin Whiskering
 - Background
 - Matte vs. Bright
 - Mechanical Behavior
 - Mitigation (component-level)
 - Mitigation (OEM level)
 - Prediction
- Solderability Platings
 - ENIG Failure Mechanisms
 - Immersion Tin Failure Mechanisms
 - Immersion Silver Failure Mechanisms
 - OSP Failure Mechanisms
 - Lead-Free HASL
- Printed Board Robustness
 - Tg and Thermal Stability
 - PTH Barrel Cracking
 - Conductive Anodic Filaments
- Solder
 - Copper Dissolution
 - Mixed Solder
 - Intermetallic Formation
 - Tin Pest
- Reliability
 - Thermomechanical Wearout (Temp Cycling)
 - High-Cycle Fatigue (Vibration)

Who Should Attend?

This course is intended as an introductory to intermediate level course for board-level designers, component engineers, quality engineers, reliability engineers, and their managers.