CALCE Inform Seminar Series

Assessing The Risk Posed by Tin Whiskers

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Abstract

As the result of a global transition to Pb-free electronics, electronics parts manufacturers have switched to pure tin or high tin Pb-free alloy finishes. This change has renewed a reliability concern related to the potential formation of electrically conductive tin whiskers on pure tin or high tin alloy finished surfaces. However, it is difficult to define the extact level of risk presented by the adoption of pure tin and high tin based alloy finishes in electronic products.

This seminar presents research in the area of tin whisker formation conducted by CALCE and an algorithm to quantify tin bridging tin risk of failure from tin whiskers using a probabilistic approach. The algorithm employs statistical distributions to quantify whisker growth and Monte Carlo simulation to estimate failure risk. The goal of the algorithm is to provide a practical approach for electronic manufacturers to quantify the potential risks posed by tin whiskers.

About the presenter: Michael Osterman (Engineering Mechanics, Ph.D. University of Maryland, College Park) is a Senior Research Scientist and the CALCE Consortium Director at the University of Maryland. He is involved in the development of simulation assisted reliability assessment software and simulation approaches for estimating time to failure of electronic hardware under test and field conditions. Dr. Osterman is one of the principle researchers in the CALCE effort to develop simulation models for temperature cycling fatigue of Pb-free solder. He has been involved in the study of tin whiskers since 2002 and has authored several articles related to the tin whisker phenomenon. He has written various book chapters and numerous articles in the area of electronic packaging. In addition, he heads the development of simulation based failure assessment software at CALCE. He is a member of IEEE, ASME, and SMTA.