

## CALCE Web Seminar

# Reliability of Multilayer Ceramic Capacitors with Flexible Terminations

Date: February 27, 2007

Telecon and Webex start at 11:00am U.S. Eastern (8:00am U. S. Pacific)

Multilayer layer ceramic capacitors (MLCC) are known to be susceptible to cracking when subjected to excessive printed circuit board (PCB) flexure. These bending events can occur due to mechanical stresses in the application environment or during manufacturing operations such as depanelization, connector insertion, screw or bolt attachment, or in-circuit testing. In addition, board-assembled MLCCs are susceptible to cracking due to rapid changes in temperature. In order to reduce the amount of stress that is transmitted to the brittle ceramic body of MLCCs through end terminations, a flexible polymer termination system was developed by some manufacturers.

This presentation will compare flexible-termination vs. standard-termination MLCCs. It will examine the impact of board-level flexure using four-point bending tests, for capacitors assembled with both lead-free solder (Sn3.0Ag0.5Cu) and eutectic tin-lead (Sn37Pb) solder. It will also present results of environmental stress tests involving high temperature/bias and temperature/humidity/bias.

**About the Presenter:** Michael H. Azarian is a research scientist at CALCE with research interests which include failure mechanisms in electronic components and assemblies and reliability of photonic and high speed electronic devices. His recent focus has been on capacitor reliability issues and electrochemical failure mechanisms in printed circuit boards. He also has technical publications in the fields of advanced packaging, sensor technology, tribology, and colloid science, and holds 5 U.S. patents for inventions in data storage and contamination control. He has been an invited conference speaker and guest lecturer on the topics of nano-tribology and reliability. He holds Ph.D. and Masters degrees in Materials Science and Engineering from Carnegie Mellon University, and a Bachelors degree in Chemical Engineering from Princeton University.