Reliability of Multilayer Ceramic Capacitors

Date and Time:
August 9th starting at 11:00am U.S. Eastern (8:00am U. S. Pacific)

Telecon and Webex:
Call-in number and URL to be announced

Multilayer ceramic capacitors (MLCCs) have become nearly ubiquitous in today’s electronic products across a wide spectrum of applications, with frequently more than a dozen of these components on a single circuit board. As a result, product reliability can be significantly impacted by MLCCs component failures.

MLCCs are known to undergo long-term aging, resulting in degradation whose response to temperature and voltage bias has been characterized. Other causes of MLCC degradation and failure remain less well understood and therefore represent a source of uncertainty for reliability risk assessments. This is the case for moisture effects on capacitor degradation and cracking due to mechanical and thermal stresses.

This web seminar will summarize recent studies at CALCE and elsewhere on MLCC aging, moisture-induced degradation, and cracking. It will include a discussion of failure modes associated with cracking, including intermittents and catastrophic failures due to shorting and ignition. It will also cover experimental methods for detection of cracks, and offer guidelines and recommendations for reducing the risk of capacitor cracking. Finally, it will present some technological solutions which may offer long-term solutions to the cracking problem.

About the Presenter: Michael H. Azarian is a research scientist at the CALCE Center with research interests which include failure mechanisms in electronic products, reliability of photonic and high speed electronic devices, and sensor technology. His recent focus has been on capacitor reliability issues and electrochemical failure mechanisms in printed circuit boards. He has also published in the fields of nano-tribology, scanning probe microscopy, structure and properties of thin films, 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 optoelectronic 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.