METRO IMAPS is pleased to offer the following half day Professional Development Course

May15, 2015

Clarion Hotel Ronkonkoma (formerly Holiday Inn)

Introduction to Failure Analysis of Microelectronics

Course Leader: Tom Terlizzi, VP GM Systems

Course Description

The design and packaging of microelectronic devices such as hybrids, RF microwave modules, Class III medical implants and other types of packaged microcircuits intended for high reliability systems is a critical aspect of reliability engineering. This webinar is intended to review and highlight the typical kinds of microelectronic packaging related failures that occur during manufacturing, qualification and the unfortunate field failures. A review of FA tools and techniques that are utilized to understand root cause of failure and guide corrective actions is presented.

The instructor shares his years of experience related root cause FA investigations of microcircuit packaging defects and failures. Mismatched CTEs and poorly designed packages geometries often lead to mechanical failure at the die and substrate interface or cracking at the heel of a wire or ribbon bond interconnect. Careful delid, visual inspection followed by SEM and EDAX/Auger are required to identify root cause. Reliability engineers must be cognizant of the full range of FA tools available to diagnose failures and, resist the temptation to rush to judgment, which often happens destroying valuable evidence along the way. The instructor will review real world specific examples of packaging failures and resultant FA analysis and problem resolution.

This course is intended as an introductory to intermediate level course for reliability engineers, design, quality and process engineers and others involved in understanding how to analyze microelectronic failures.

Course Outline

- Introduction to Microelectronic Packaging
- Terminology and Product Definitions

    - Hybrids, Microwave Modules, MEMS, Optoelectronic Devices, Class III implants
- Failure Analysis definition/Why Failure Analysis?
- Failure Analysis vs. Yield Analysis
- Electrical vs. Mechanical
- Root Cause, Fishbone Diagrams, Forensics
- Typical Package Related Defects and Failures
- Failure Analysis (FA) Process Flow
    - Review of common FA equipment and procedures
- Solving Problems using Failure Analysis by Teamwork and Technique
- Specific Examples of Package Related Failures and FA Investigation
    - Die, substrate and package compatibility issues
        - Coefficient of Thermal Expansion (CTE) problems
        - Voiding under the die
        - Sliver dendrites growing from silver loaded epoxy
    - Wire and ribbon bond failures
        - Bond lifts due to contamination
        - Heel cracks
        - Excessive intermetallic formation
    - Package plating issues
        - Plating issues that lead to wirebond failures
        - Au embrittlement
    - Loose conductive particles and Murphy's law
        - Foreign material identification and control
    - Hermetic package seal issues
        - Moisture related failures
        - Outgassing problems
    - Using Residual Gas Analysis (RGA) as an FA tool and process indicator
    - Non-hermetic molded package defects and failures
    - Electrical Overstress and ESD, Failure Analysis Labs
    - Where to get more reference information on FA of Microelectronics…
    - Attendees are welcome to share any FA problems
    - Case studies from the field
- Class Review plus Q&A

About the instructor:

Tom Terlizzi is V.P. at GM Systems LLC a Management and Technology consulting firm, providing Marketing & Sales strategy, project management, technology transfers, microelectronic and RF/Microwave Product Design/development. For over 35 years, he has designed and developed power management systems, single board computers, microelectronic devices, thick and thin film hybrids, COB modules, Integrated Circuits, RF and Microwave MCMs, and fiber optic modules, for military, aerospace, telecom and consumer markets at Aeroflex, Agile Microwave Technology, Norden Systems/UTC, Grumman, General Instrument. He also has spearheaded ISO9000/Military quality certifications. He received a BEE from CCNY and a MSEE from NYU-Poly. Tom currently writes a blog for EDN Online and has published several articles, papers, tutorials at international conferences, edited books on electronic packaging, consulted for the DoD on advanced electronic packaging as well as teaching electronics at the US Army Signal School. He is a past president of the Metro Chapter of IMAPS.

Course fees: 450.00 IMAPS Member 500.00 Non Member
Includes continental breakfast and lunch
Also included is admission to the METRO Chapter Vendor Night and Cocktail Reception immediately following
Group discounts are available
Contact Steve Lehnert Phone (650) 644-5218
Email: metroimaps@optonline.net to register

Time: 9:00 AM-2:30 AM
Registration and Continental Breakfast start at 8:45 AM
Location: Holiday Inn Ronkonkoma
3845 Veterans Highway
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