TUTORIAL 1: Testing for 1st and 2nd Level Electronics Packaging

DATE: September 13th, 2010 from 01:30 pm to 05:00 pm

HEAD OF TUTORIAL: Prof. Klaus-Jürgen Wolter, *TU Dresden, Electronics Packaging Lab.*

INSTRUCTORS:
Oliver Albrecht, *TU Dresden, Electronics Packaging Lab*
Jan Heiber, *GÖPEL electronic GmbH, Jena*
Norbert Gust, *TU Dresden, Electronics Packaging Lab*
Henning Heuer, *Fraunhofer Institute for Non-Destructive Testing - Dresden branch*
Malgorzata Kopycinska-Müller, *Fraunhofer Institute for Non-Destructive Testing - Dresden branch*
Maik Müller, *TU Dresden, Electronics Packaging Lab*
Martin Oppermann, *TU Dresden, Electronics Packaging Lab*
Steffen Sturm, *InfraTec GmbH, Dresden*
Klaus-Jürgen Wolter, *TU Dresden, Electronics Packaging Lab*

OBJECTIVES OF THIS COURSE:
Advanced electronics packaging is a challenge for non-destructive Testing (NDT). Our course will impart fundamentals and applications for non-destructive evaluation of inner and outer structures and electrical testing of electronics packaging for quality assurance and reliability investigations.
We will use a conventional USB memory drive with stacked dies to present possibilities and limitations of high-resolution NDT methods for electronics packaging like X-ray diagnostics, Scanning Acoustic Microscopy and Atomic Force Acoustic Microscopy beside improvements in electrical testing using the Boundary Scan method. To complete the main part we will mirror and compare the gained results of NDT by the results of destructive techniques with focus on future needs and requirements of NDT methods regarding advanced electronics packaging. A further part of our tutorial will deal with NDT for photovoltaic systems.
All of our activities in the field of NDT are hosted by "nanoeva® - the center for non-destructive nano evaluation", a common institution of the Fraunhofer Institute for Non-Destructive Testing – Dresden branch as well as the Electronics Packaging Lab and the Centre of Microtechnical Manufacturing at the Dresden University of Technology.

WHAT YOU WILL LEARN:
1. Fundamentals of nano packaging and NDT
2. Possibilities and limits of established techniques like X-ray methods and Scanning Acoustic Microscopy (see Fig. 1)
3. Limits and applications of new techniques like Atomic Force Acoustic Microscopy
4. Introduction of electrical testing with Boundary Scan
5. Testing of solar cells with Lock-in-Thermography and Eddy Current based methods
6. nanoeva® as the host of our NDT activities

COURSE OUTLINE:
1) Introduction – What are the advantages of 3D packaging? - Klaus-Jürgen Wolter
2) What's inside my USB drive? - X-Ray Microscopy and X-Ray nano CT for 3d packaging - Martin Oppermann
3) Electrical test with Boundary Scan Technology - Mario Berger
4) High resolution Scanning Acoustic Microscopy for advanced packaging – Norbert Gust

5) Atomic Force Acoustic Microscopy – Inspect the thin layers! - Malgorzata Kopycinska-Müller
6) Metallography, SEM & EBSD – The destructive choice - Maik Müller
7) Lock-in-thermography for solar cells - Steffen Sturm
8) Eddy Current based methods for process control and quality assurance in solar cell and display production and for electrical conductive multi-layer systems - Henning Heuer
9) Some words about "nanoeva®", the center for non-destructive nano evaluation - Oliver Albrecht

WHO SHOULD ATTEND:
Engineers, scientists and managers involved in the development, design, process, manufacturing and quality assurance of electronic packaging, electronic components and hybrid packaging.

ABOUT THE INSTRUCTORS:
The instructors are well known engineers and scientists from industries and scientific institutions. They are many years in practice and are experts in their fields of interest.
Head of the tutorial is Prof. Klaus-Jürgen Wolter. He is the director of the Electronics Packaging Lab and of the Center of Microtechnical Manufacturing at the TU Dresden. In cooperation with Prof. Meyendorf from the Fraunhofer IZFP-D, he also acts as the director of "nanoeva® - the Center for Non-destructive Nano Evaluation". He is author and co-author of more than 100 publications in the filed of electronics packaging and non-destructive testing. Prof. Wolter was the General Chair of the first ESTC 2006 in Dresden.

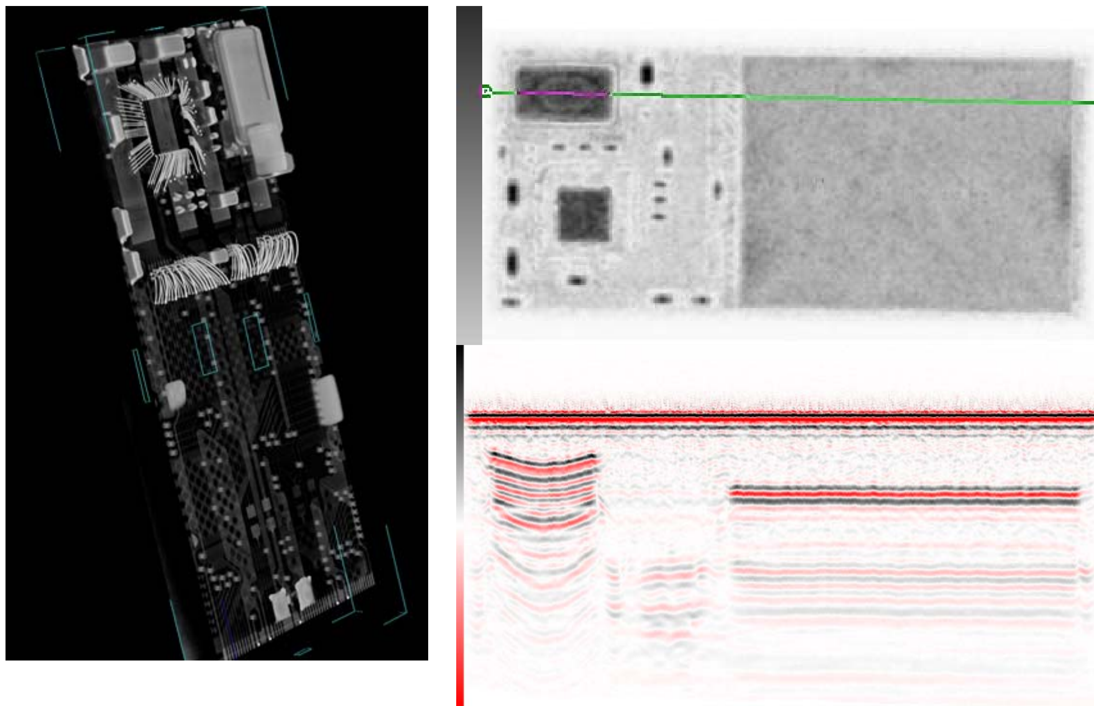

Fig. 1. NDE results of a USB memory device (left: X-ray computed tomography / right: Scanning Acoustic Microscopy)

More information and registration: www.estc-2010.de