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Reliability, Packaging, Testing, and Characterization of MOEMS/MEMS, Nanodevices, and Nanomaterials XIII

Herbert R. Shea
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Introduction

A successful MOEMS-MEMS device is built on more than the physical sensor or actuator and the associated electronics. Packaging plays a key role in device performance, lifetime, and cost. Given the strong interaction between the environment and MOEMS-MEMS sensors, and given the multiphysics nature of all MOEMS-MEMS devices, novel testing and characterization methods are required to understand MOEMS-MEMS failure modes. Novel assembly, integration, and packaging approaches are being developed, all posing qualification challenges.

This MOEMS-MEMS symposium brought together experts in a broad range of fields to discuss the latest advances in the fields of MOEMS-MEMS testing, packaging, reliability, and characterization.

The widespread use of MOEMS and MEMS in consumer electronics, the medical field, communications, optical communications, and even spacecraft, and the associated increased maturity of many microfabrication and packaging technologies and processes, has resulted in a marked increase in the performance of commercially available tools for characterizing MOEMS-MEMS. The increased maturity of MOEMS-MEMS has created a need for improved, higher throughput, more sensitive testing techniques for materials properties and device performance. Several exciting new approaches were presented at this symposium as well as the Reliability conference.

The use of MOEMS-MEMS in ever-harsher environments (high temperature, high radiation, high shocks, and vibration, etc.) is enabled by the use of new materials, such as GaN, which in turn require novel processing techniques, new testing techniques, and test equipment. One accelerated testing approach adapted from the standard microelectronics field is HALT (Highly Accelerated Lifetime Testing) that was shown to be applicable to assess the reliability electronic packaging.

This symposium also included novel integration technologies, and the use of non-conventional materials for new applications. Examples of complete MOEMS and MEMS systems were also presented, with the associated reliability challenges.

We invite you to explore these proceedings and we look forward to seeing you next year for another lively symposium.

Herbert R. Shea
Rajeshuni Ramesham

