

Don't forget reliability during MEMS development

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Short bio



After receiving the PhD in Physics from the KU Leuven in 1989, Ingrid De Wolf joined the nanoelectronics research center IMEC, where she worked on microelectronics reliability, with special attention for mechanical stress- and failure analysis. From 1999 to 2014, she headed a research group focusing on reliability, test and modelling of 3D technology, interconnect, OIO, MEMS and packaging. In 2007 she became part time professor at the department of Materials Engineering of the KU Leuven. She (co-) authored more than 550 publications and won several best paper awards. She is currently fellow at IMEC and program director of the Master Program Nanoscience, Nanotechnology and Nanoengineering of the KU Leuven.

Abstract

In this talk, using many examples, the need for a correct and timely reliability assessment of micro-electromechanical systems (MEMS) is demonstrated.

Reliability is defined as ‘The probability that an item will perform a required function under stated conditions for a stated period of time’. Because reliability testing is time consuming, it is often only considered towards the end of the development cycle of a MEMS. However, as reliability highly depends on the design, the used materials, the manufacturing processing, and the packaging methodology, it is mandatory to consider it very early during the design phase. In addition, the correct reliability tests should be performed, depending on the mission profile of the device, the expected failure mechanisms, and in-depth knowhow on the physics of failure.