Christoph Sander: Imaging Techniques for Advanced Characterization of Nano-Electronic Materials

Abstract

Mechanical properties of low-k and ultra-low-k materials are an important input for simulations and the design of new, state-of-the-art integrated circuits. This paper reviews three advanced measurement techniques - the four-point-bend test, the double cantilever beam experiment and the nano-indentation technique - and describes procedures to measure the adhesion, CTE, and mechanical strength of composite materials in 3D integrated dies with high local resolution. All mentioned techniques are modified and enhanced by the help of image-based measurement methods. With these modifications, the tests are significantly accelerated, automated and more reliable.

Keywords

3D integration, adhesion, indentation, image processing, ImageJ

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