

ABSTRACT:

Mechanical Stress: A Never-Ending Story in Microelectronics

From the early days of microelectronics development, mechanical stress has played a role. Either in a negative sense, causing crystal defects in the Si substrate, or in a positive, improving mobility. With increasing complexity of microelectronic systems, 3D technologies, combined with OIO, chiplets, etc., the role of mechanical stress only increased. Not only other defects such as delamination and cracking were observed, but it was shown that local stresses induced by solder bumps and TSVs in the silicon affect the properties of nearby devices, causing variability and raising the discussion for the need of a keep-out zone.

Over the years several researchers at imec studied ways to measure mechanical stress, to understand its interaction with devices, and to understand chip-package interaction. This talk provides an overview of some of the main results.

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