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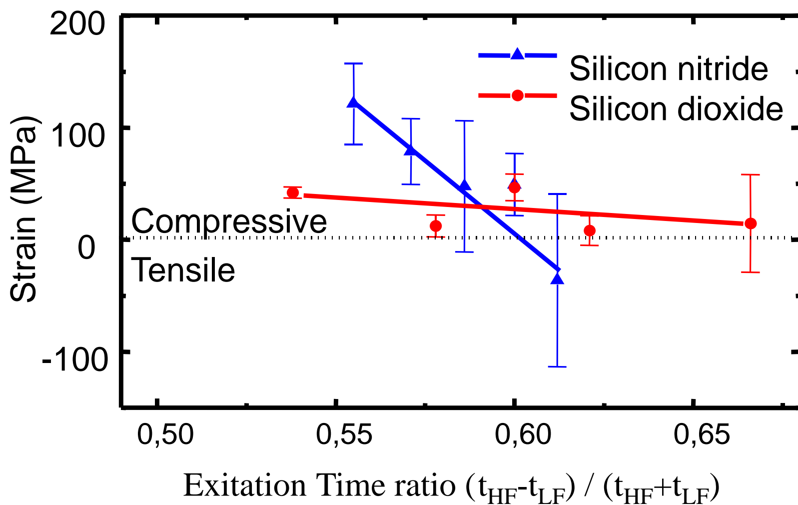
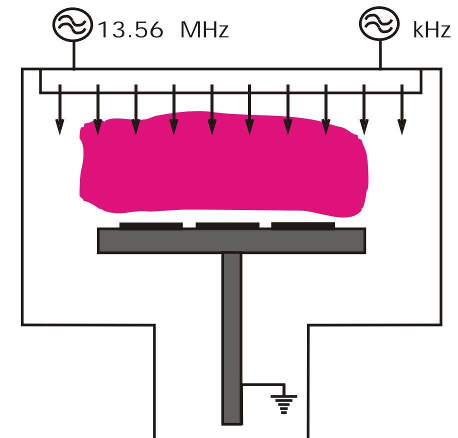
Plasmalab Data

Stress Control for Si3N4 and SiO2 PECVD





Plasma Enhanced Chemical Vapour Deposition (PECVD)

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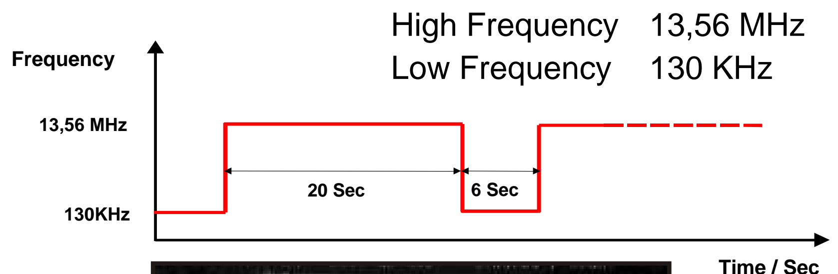
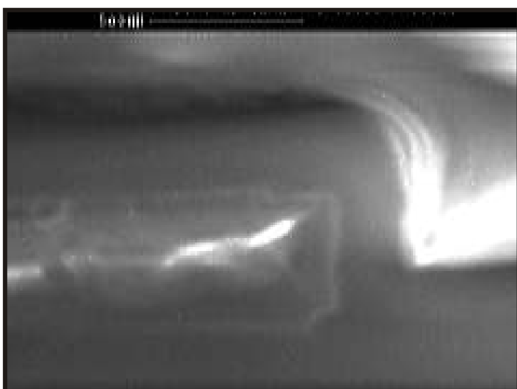
Plasmalab 80 Plus
Plasmalab 800 Plus
Plasmalab System 100
Plasmalab System 133

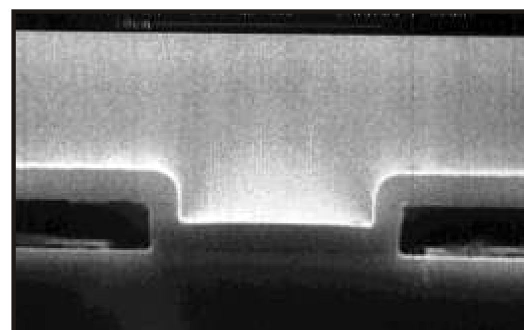
deposition rates
10 - 20 nm / min for SiN
30 - 60 nm/ min for SiO
very good uniformity

Strain control of films is of very high importance for the fabrication of microstructures by bulk and surface micromachining. The key parameter to control the material strain of films deposited by Plasma Enhanced Chemical Vapour Deposition (PECVD) is the plasma excitation frequency, which influences the ion bombardment energy. The behaviour of the mechanical stress of thin dielectric films - e.g. silicon nitride and silicon dioxide - using frequency interlacing of 130 KHz (low frequency) and 13,56 MHz (high frequency) was studied. Stress control was achieved between tensile (-40 MPa) and compressive (+120 MPa) approaching zero stress as close as 5 MPa.

High Frequency 13,56 MHz
Low Frequency 130 KHz







SiO (top, OPT lab) and SiN (right, IMO Wetzlar) PECVD with good step coverage