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ANALYSIS OF LEAKAGE CURRENT IN EXTREMELY SCALED HfO_2 GATE STACK DEPOSITED BY ALD

SAVITA MAURYA, B. R. SINGH & M. RADHAKRISHNA

Division of Electronics & Microelectronics, Indian Institute of Information Technology, Allahabad, Uttar Pradesh, India

ABSTRACT

It has been observed that the atomic layer deposition (ALD) and electrical properties of high-K oxides are strongly influenced by interfacial sub oxide formation, making pre and post deposition surface preparation and annealing conditions important. In this paper, we present a systematic experimental study on the leakage behaviour of extremely scaled HfO2 gate stack on silicon, deposited using atomic layer deposition process. The impact of deposition temperature, pre and post annealing parameters and surface conditions on the leakage behaviour in both accumulation and inversion regions is presented.

KEYWORDS: ALD, Pre-Deposition Annealing, Post-Deposition