Germanium nanoparticles grown at different deposition times for memory devices applications

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PII: S0040-6090(16)30177-8
DOI: doi: 10.1016/j.tsf.2016.05.026
Reference: TSF 35209

To appear in: *Thin Solid Films*

Received date: 20 June 2015
Revised date: 4 May 2016
Accepted date: 16 May 2016

Please cite this article as: M. Mederos, S.N.M. Mestanza, R. Lang, I. Doi, J.A. Diniz, Germanium nanoparticles grown at different deposition times for memory devices applications, *Thin Solid Films* (2016), doi: 10.1016/j.tsf.2016.05.026

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Abstract

In the present work, circular Metal-Oxide-Semiconductor capacitors with 200 μm of diameter and Germanium (Ge) nanoparticles (NPs) embedded in the gate oxide are studied for memory applications. Optimal process parameters are investigated for Ge NPs growing by Low Pressure Chemical Vapor Deposition at different deposition times. Photoluminescence measurements showed room-temperature size-dependent green-red region bands attributed to quantum confinement effects present in the NPs. High-frequency Capacitance versus Voltage measurements demonstrated the memory effects on the MOS structures due to the presence of Ge NPs in the gate oxide acting as discrete floating gates. Current versus

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