



Institut de Microélectronique, Electromagnétisme et Photonique

IMEP-LAHC, Minatec-INPG, BP 257

38016 Grenoble cedex 1, France

Vendredi 14 octobre 2011 à 11h
Salle M253 Batiment PHELMA (2^oétage)
Séminaire exceptionnel

RTS in Submicron MOSFETs: Lateral Field Effect and Active Trap Position

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Abstract. Experiments were carried out for n-channel devices, processed in a 0.3 μm spacerless CMOS technology. The investigated devices have a gate oxide thickness of 6 nm and the effective interface area is $A_G = 1.5 \mu\text{m}^2$. The RTS measurements were performed for constant gate voltage, where the drain current was changed by varying the drain voltage. The capture time constant increases with increasing drain current. The model explaining the experimentally observed capture time constant dependence on the lateral electric field and the trap position is given. From the dependence of the capture time constant τ_c on the drain current we can calculate x-coordinate of the trap position. Electron concentration in the channel decreases linearly from the source to the drain contact. Diffusion current component is independent on the x-coordinate and it is equal to the drift current component for the low electric field. Lateral component of the electric field intensity is inhomogeneous in the channel and it has a minimum value near the source contact and increases with the distance from the source to the drain. It reaches maximum value near the drain electrode.

Prof. RNDr. Sikula Josef, DSc

Josef Sikula received his M.Sc. degree in Electronics from the Technical University of Prague in 1957, and his M.Sc. degree in Physics from Komensky University, Bratislava in 1960. He received his Ph.D. degree in Semiconductor Physics in 1965 from St Petersburg University Russian and DSc in Applied Physics from Czech Technical University Prague in 1980. He is from 1980 Professor of Applied Physics. Prof. Sikula is a member and past president of the International Microelectronic and Packaging Society Czech and Slovak Chapter and member of ICNF International Advisory Committee. He has published more than 150 papers on various aspects on noise spectroscopy, non-destructive testing, and defect engineering. Currently, Prof. Sikula is a Professor of Applied Physics at Brno University of Technology, Czech Republic.