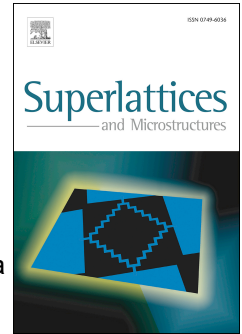


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Capacitance Modeling of Gate Material Engineered Cylindrical/Surrounded Gate MOSFETs for Sensor Applications

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Abstract

This paper presents charge based analytical drain current and capacitance model of material engineered Cylindrical/Surrounded Gate (CGT/SGT) MOSFET with nanogap cavity region for sensor applications. Material engineered i.e. dual material gate provides improvement in Short Channel Effects (SCEs) and cylindrical shape nanogap cavity region is used for sensing of biomolecule strength. The material engineered CGT/SGT MOSFET sensor electrically detect the targeted biomolecules of different strength by change in drain current and gate capacitance. Analysis has been carried out by using unified charge control based model derived from Poisson's equation. It is shown that sensitivity of changing biomolecules strength is more in gate capacitance than the drain

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