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# An accurate simulation study on capacitance-voltage characteristics of metal-oxide-semiconductor field-effect transistors in novel structures

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## Abstract

An essential and important method for physical and electrical characterization of a metal-oxide-semiconductor (MOS) structure is the capacitance-voltage (C-V) measurement. Judging from the C-V characteristics of a MOS structure, we are allowed to predict the DC and AC behaviors of the field-effect transistor and extract a set of primary parameters. The MOS field-effect transistor (MOSFET) technology has evolved to enhance the gate controllability over the channel in order for effectively suppressing the short-channel effects (SCEs) unwantedly taking place as device scaling progresses. For the goal, numerous novel structures have been suggested for the advanced MOSFET devices. However, the C-V characteristics of such novel MOS structures have not been seldom studied in depth. In this work, we report the C-V characteristics of ultra-thin-body (UTB) MOSFETs on the bulk Si and silicon-on-insulator (SOI) substrates by rigorous technology computer-aided design

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