Abstracts

MOSFET bulk effect behaviour and estimation for microwave-frequency modeling

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This paper describes MOSFET bulk effect behaviour as a function of width and gate/drain bias. The conductance from the intrinsic bulk to the bulk straps is measured directly using a modified MOSFET device. Measurements confirm that the bulk conductance follows a linear relation with respect to device width and is dependent of both gate and drain bias. By extracting the bulk conductance using low frequency S-parameter measurements, the paper presents a method to identify which MOSFET layout gives the lowest bias dependency on bulk effects. Due to active area edge effects, fairly small finger widths appear to greatly simplify bulk effect modeling for RF applications. The validity of extracted bulk effects are investigated at microwave frequencies by comparing device simulations with measurements.

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