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The Calculation for the Microscopic Capacitance of Gate Electrode in High Electron Mobility Transistors CHIN-SHENG WU, Yuan Ze University — Novel nanodevices have developed below 60 nm. Accurate characterization requires detailed electronic structure. In field effect transistor, a dielectric layer isolates the channel from the gate electrode. The model is based on the nanoscale MOSFET with gate length 60 nm, channel length 25 nm and insulator thickness 10 nm. The capacitance of the gate is the series combination of the geometric capacitance. Its dielectric constant is associated with the local electron density. The carrier density decreases from the source to drain in the channel. The capacitance is assumed in parallel connection along this direction.

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