



Bulk Planar CMOS Transistor Models

BSIM-BULK 107.2.0 (Berkeley Short-channel IGFET Model)

Developed by: University of California at Berkeley

Accuracy and Predictability Improvements

- Accuracy improvements for impact ionization
- Modeling of conductivity modulation (expansion) effect
- Flicker noise model enhancement

Bug Fixes

- Correction in substrate current flow
- Negative Cgd (in certain circumstances)
- Correction in exponent factor of electric field in the drift region
- Drain side and source side drift resistance symmetry

PSP 104.0.0

Developed by: CEA-Leti

Accuracy Improvements

- Improved gm description in saturation regime
- Improved drain saturation current accuracy for long-channel transistors

Bug Fixes

- Bug fix to make source and drain access resistance independent of the number of fingers
- Bug fix associated with Cgb-Cbg reciprocity in strong inversion regime

Planar SOI Transistor Models

BSIM-SOI 100.1.0. (Silicon-On-Insulator)

Developed by: University of California at Berkeley

Accuracy Improvements

- Improvements to self-heat calculation
- Addition of independent body resistance for body contact parasitic FET
- Addition of noise QA tests

Bug Fixes

- Removal of unwanted kinks in gds vs Vd for SOIMOD=0
- Use bias-independent strobe conditions

L_UTSOI 102.8.0

Developed by: CEA-Leti

Accuracy and Predictability Improvements

- Introduction of edge transistor, with associated local and global variables
- Introduction of a switch that adds Q-model decoupling

Bug Fixes

- A fix to a current discontinuity involving details in the Non Quasi-Static (NQS) calculation
- Single and multi-gate 3D Devices

Single and Multi-Gate 3D Transistor Models

BSIM-IMG 103.1.0 (Independent Multi-Gate)

Developed by: University of California at Berkeley

Accuracy and Predictability Improvements

- Add induced gate noise in thermal noise
- The aging defect screening model
- MobilityTemp dependence of bias-independent S/D resistance
- Rsourcegeo/Rdraingeo multiplication with width
- Add sign of modulation in flicker noise model

Correct code implementation in RDSMOD=2

- Missing impact ionization current in the self-heating power

GaN HEMT Transistor Models

ASM-HEMT 101.5.0

Developed by: Macquarie University

Accuracy and Predictability Improvements

- Schockley-Read Hall (SRH) physics-based model for trapping included
- Added leakage currents from drain to substrate and source to substrate in high-voltage devices, including temperature dependence
- For gatemod=3, included gate leakage current model for P-Gan device to account for ideality factor and bias-dependence effects
- Mobility dependence -- Added substrate bias dependence effects

Bug Fix

- Trapmod=3 fixed a sharp transition that could have caused a convergence issue in the simulator. The model now provides a smooth transient.

MVSG 4.0.0

Developed by: University of Waterloo

Accuracy Improvements

- New p-GaN capacitance model: Conserves charge, uses smoothing with bias approaches built-in potential
- High injection formulation in Schottky diode forward mode calculation: new formulation ensures current is monotonic and behaves physically

Bug Fixes

- Fix to case