

Release Note for HiSIM 2.8.0

Hiroshima University & STARC

Revision: HiSIM 2.8.0

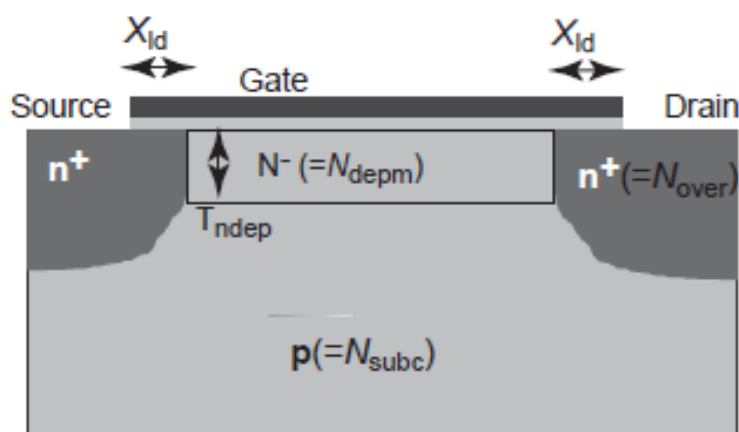
Date: 2014.6.5

Deliverable List of HiSIM 2.8.0

Deliverable	File Name or Directory Name	Date
Verilog-A Code	HiSIM_2.8.0_VA-Code	2014.6.5
C Code	HiSIM_2.8.0_C-Code	2014.6.5
Release Note	HiSIM_2.8.0_Release_Note.pdf	2014.6.5
User's Manual	HiSIM_2.8.0_Users_Manual.pdf	2014.6.5
Default Model Parameters	HiSIM_2.8.0_Default_Model.txt	2014.6.5
Default Instance Parameters	HiSIM_2.8.0_Default_Instance.txt	2014.6.5

Update information of HiSIM 2.8.0 from HiSIM 2.7.0

- 1) New depletion mode MOSFET model if the model flag **CODEP** is set to 1



Typical depletion mode MOSFET structure with additional device parameters

Please refer to User's Manual for detailed description

Caution: STI leakage, channel length modulation, thermal noise and induced gate noise are not supported yet in this depletion mode model.

- 2) Changed Model Descriptions

- Improvement of the calculation of $V_{ds,eff}$ as follows with new model flag **CODDLT**.

$$V_{ds,eff} = \frac{V_{ds}}{\left[1 + \left(\frac{V_{ds}}{V_{ds,sat}}\right)^{\Delta}\right]^{\frac{1}{\Delta}}} \quad \Delta = \frac{DDLTMAX \cdot T1}{DDLTMAX + T1} + DDLTICT$$

$$T1 = DDLTSLP \cdot L_{gate} \cdot 10^6$$

CODDLT=1: New $V_{ds,eff}$ model(Default)

CODDLT=0: Previous $V_{ds,eff}$ model

- Change of model parameter range for: **RSH** , **QME2** , **QME3** and **VFBC**
- Change of default values for the model parameters

QME2, **DDLTICT** and **DDLTSPL**

VFBC , **NSUBC** , **LP** , **NSUBP** and **MUESR1** if the model flag **CODEP** set to 1

3) Compatibility of VA-Code with C-Code (Request from Mentor)

The new MACRO "BPxxxx" is prepared to handle the parameters treated as both instance and model parameter

- Older VA-Code
`MPRnb(RBPB , 50.0E0 , " " , " comment")
- Newer VA-Code
``BPRnb(RBPB , 50.0E0 , " " , " comment")

4) Bugfixes

- Thermal noise when **CORSRD** > 0 (Previously not correct)
- Model for substrate current **Isub**
- Floating point exception in the **Fn_Pow** function
- Convergence issue in some commercial simulators (VA-code)
- Vbs dependence of the printed output for Vth (Report from Cadence)