

Minutes of May 3, 2006 CMC Teleconference  
PSP101 Evaluation Results

Attendance:

IBM, Freescale, Infineon, Cypress Semiconductor, RF Micro Devices, Agere, Agilent, Jazz Semiconductor, Philips, Texas Instruments, Pennsylvania State University

Review of Infineon Report:

(see [http://www.eigroup.org/cmc/next\\_gen\\_cmos/psp101/default.htm](http://www.eigroup.org/cmc/next_gen_cmos/psp101/default.htm))

Action Item:

PSP team will correct SWJUNCAP bug.

Report also describes a model code and documentation discrepancy for scaling rules of and DPHIB and Neff. According to the PSP team the manual is correct, but the code needs to be fixed.

Action Item:

PSP team will correct the DPHIB and Neff scaling equations in model code to be consistent with the documentation.

Action Item:

The PSP team will provide a detailed explanation of the DPHIB and Neff scaling rules at the Boston meeting.

The Infineon report also shows a depletion capacitance offset was introduced in PSP101 that was not present in PSP100.

Action Item:

PSP team will investigate problem.

Lastly, the Infineon report describes how the removal of the inner fringing capacitance model has made the overall bias dependent overlap capacitance model in PSP101 less accurate than PSP100. Request is to put the inner fringing model back in without sacrificing reciprocity. PSP team does not have an immediate solution. This is potentially a topic for long-term research.

Review of IBM Report:

(See [http://www.eigroup.org/cmc/next\\_gen\\_cmos/psp101/default.htm](http://www.eigroup.org/cmc/next_gen_cmos/psp101/default.htm))

IBM reported concerns about behavior of PSP101 model across  $V_{DS}=0$ . The behavior appeared to be sensitive to the value of parameter AX.

The PSP team explained AX is a parameter that affects the linear to saturation current transition. The value of the parameter has implications on behavior at  $V_{DS}=0$ .

IBM agreed that since AX can fix the problem than this is no longer a concern.

Action Item:

The PSP team will present on AX at the Boston CMC meeting.

Review of Evaluation Results from Freescale:

1. Parameters are all capital letters.

Action Item:

The PSP team will document that it is up to the simulator vendor which case they will use for parameter letters.

2. Would prefer warnings rather than silent clamping of parameters, and questions extra memory use by reassigning parameters to variables.

Action Item:

Add a PARAMCHK parameter like BSIM4 to enable modeling engineers to turn off parameter limit violations. (This is not a gate for standardization.)

3. Use of upper and lower case letters in variable names and macros is ambiguous.

No Action.

4. Are lines like "if ( $x_s < 10e-5$ )" correct or should it be  $1.0e-5$ ?

The PSP team reports these are correct.

Action Item:

The PSP team will look make a change in a future code version to reduce confusion.

5. Main issue: initial testing shows PSP to be 3-4x slower than BSIM4.

Action Item:

The speed concern will be discussed further at the Boston meeting. Additional simulation results from other member companies, including Agilent, will be shown.

Action Item:

CMC will discuss PSP expectation setting at the Boston meeting.

Meeting Adjourned.