

# 2007 Symposium on Nano Device Technology

The Symposium on Nano Device Technology 2007 organized by National Nano Device NARL, will provide an open forum for the discussion of recent developments on nano-technology and advanced devices, materials and processes. Scientists, scholars and experts in the fields

CREATE FOR THE FUTURE

**NDL** National Nano Device Laboratories  
國家奈米元件實驗室



時間: 中華民國96年5月9-15日  
地點: 新竹市科學工業園區展業一路26號 奈米電子研究大樓 國際會議廳

## 奈米元件技術研討會 2007

### 主題

- 》後矽奈米電子元件技術 ·
- 》奈米生物技術 ·
- 》功能性奈米材料技術 ·
- 》奈米檢測技術 ·
- 》高頻技術及應用 ·
- 》奈米光晶元件技術 ·

## PSP Device Modeling Overview and Experience Sharing

Toe-Naing Swe,  
Semiconductor Modeling Consultant,  
Agilent Technologies

### ABSTRACT

The PSP model is a symmetrical, surface-potential-based model selected by the Compact Modeling Council as a standard complementary metal oxide semiconductor (CMOS) device model. Created by Philips Research (now NXP) and the research group at Penn State University lead by Prof. Gildenblat, the model was developed with the following goals in mind:

- \* suitable for digital, analog, and RF;
- \* suitable for modern and future bulk CMOS technologies;
- \* physics-based;
- \* simple parameter extraction

In this paper, we will give an overview of the PSP model, including key features of the model, the model structure and a quick overview of some key parameters. We will then walk you through the model extraction flow using Agilent's ICCAP device modeling software.

-----

Toe-Naing SWE received his bachelor of engineering in 1995, and pursued his Master's degree at the Nanyang Technological University (NTU, Singapore) in 1999. He continued his research work in NTU for 3 years, working on characterization and modeling of deep submicron devices for system-on-a-chip applications.

Toe-Naing acquired extensive experience with RFIC technologies, ranging from semiconductor physics, device and test structure design, characterization and modeling of active/passive devices. Prior to his employment with Agilent Technologies, he characterized and modeled the processes of 3 major silicon foundries in Asia/Europe.

Toe-Naing joined the Agilent Modeling Center in Jan 2001 and is one of the key members of the technical delivery team. He is responsible for the parameter extraction of noise parameters, spiral inductor models, BSIM3/4, PSP, BSIMSOI, MEXTRAM, HICUM and other industry standard models.

Toe-Naing specializes in high frequency measurement, involving network analyzers, parametric sources, precision impedance analyzers and noise parameter measurement systems. He has extensive experience with various device modeling softwares, especially Agilent's IC-CAP and SPICE-based simulators.