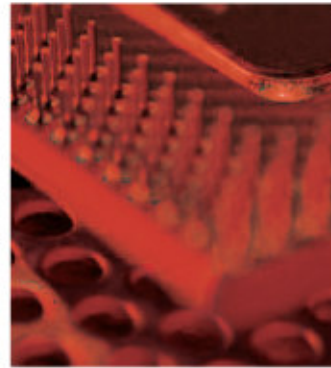




**FSA**



# FSA MIXED-SIGNAL/RF SPICE MODEL CHECKLIST

Introduction and Background

Kenneth Brock  
VP Marketing, Silvaco  
August 11, 2005

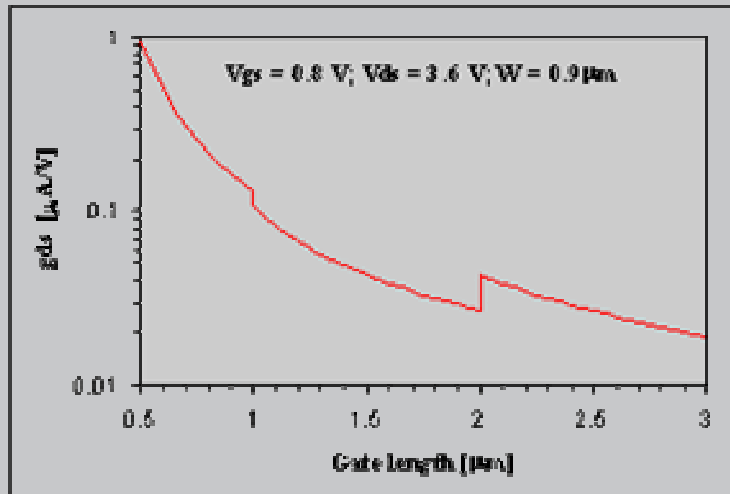


## MS/RF SPICE MODEL WORKING GROUP

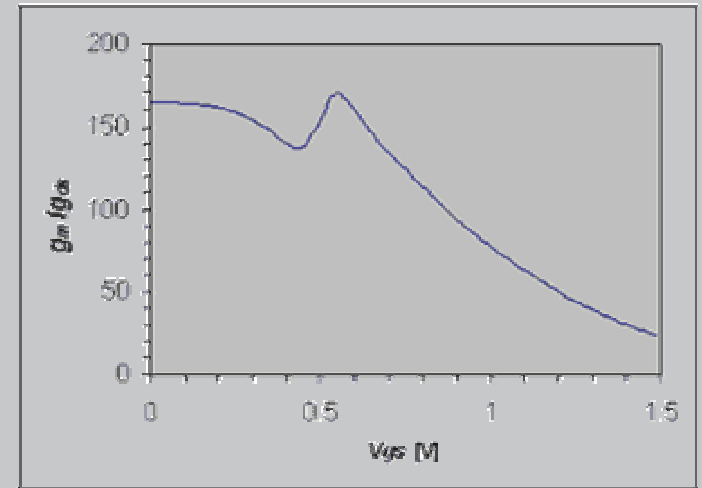
- Working Group Objectives
  - Identify common issues shared by the foundry, fables, EDA, IP and design service providers in the development and use of SPICE models with a focus on RF and Mixed-Signal
  - Develop a format for SPICE model representation and common terminology for describing model contents and inputs
  - Establish fables customer requirements for MS/RF SPICE models
  - Define SPICE model quality criteria at critical delivery milestones
  - Streamline the SPICE model extraction and distribution process



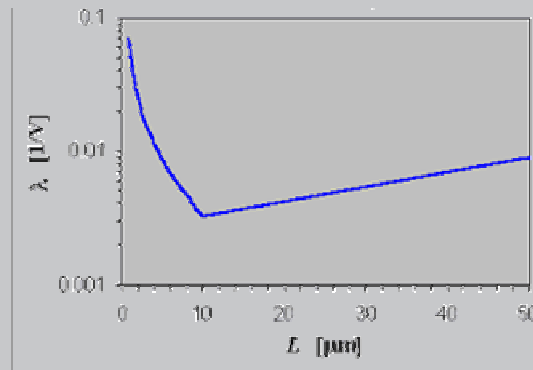
# PROBLEMS WITH FOUNDRY MODELS



Discontinuous channel conductance across bias due to binning



Nonphysical modeling of intrinsic gain



Nonphysical modeling of normalized output conductance



- Objective
  - Develop SPICE Model Checklist with recommended circuit measurements, and reports/graphs, delivered with each foundry model, to quantify and improve quality of foundry Digital, Analog, and RF models
- Prior Art
  - FSA MOS Model Validation Procedures – November 1995
  - IEEE Recommended Practices #P1485 on Test Procedures for Micro-electronic MOSFET Circuit Simulator Model Validation - May 1997
  - CMC Bipolar Model Standardization Proposed Standard Data Sets - 1999
  - Benchmark tests (10) for MOSFET models developed at the SEMATECH Compact Model Workshop – 1995





## MS/RF SPICE MODEL CHECKLIST

- History of PDK Working Group
  - October 2002 - Founding of MS/RF Foundry Subcommittee
  - October 2003 - Checklist concept is born at FSA Supplier's Expo for PDKs
  - March 2004 - PDK Checklist Adopted by foundries
  - December 2004 - Foundries report full adoption
  
- History of SPICE Model Working Group
  - August 2004 - Formed SPICE Model working group from PDK Checklist working group
  - August 2005 - Model Checklist adopted by leading foundries





## MS/RF SPICE MODEL CHECKLIST

- Agenda – 10:00am to 11:30am
  - Introduction Background – Ken Brock, Silvaco
  - Importance and Value of Modeling – David Schwan, Micro Linear
  - Checklist Tutorial – Ken Brock, Silvaco
  - Foundry Perspective – Jim Victory, Jazz Semiconductor
  - EDA Supplier Perspective - Ken Brock, Silvaco
  - Fabless Perspective – Mishel Matloubian, Mindspeed
  - Q&A – Open Discussion

