



Compact Model Council

Keith Green (TI)
Chair

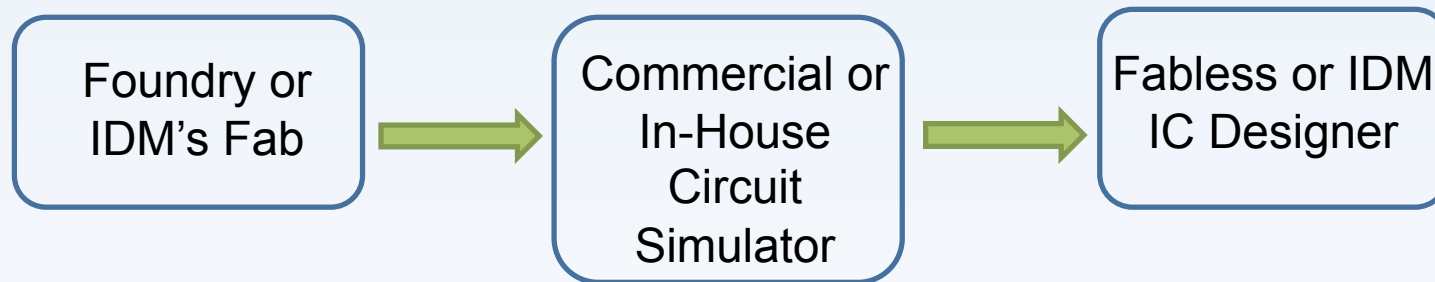
Peter Lee (Elpida)
Vice Chair

History and Purpose



Silicon Integration Initiative

- The CMC was formed in 1996 as a collaboration of foundries, fabless companies, IDMs and EDA vendors



- Compact models provide the connections.
- Standard compact models enable efficiencies in this process.

Members



Silicon Integration Initiative

Agilent	AIST	Altera	Analog Devices	ams
Broadcom	Cadence	Cypress	Denso	Elpida
Fujitsu Semiconductor	Global Foundries	IBM	Infineon	Intel
LEAP	LSI Corporation	Maxim	Mentor Graphics	NXP
Panasonic	ProPlus	Qualcomm	Renesas Electronics	Ricoh
Samsung	Silvaco	SK Hynix	Sony	STARC
ST Micro	Synopsys	TI	Toshiba	Toyota
TSMC	UMC			

Presently 37 member companies.

University Partners



- **University of California at Berkeley – Professor Chenming Hu**
 - BSIM3, BSIM4, BSIM6, BSIM-SOI and BSIM-CMG
- **Hiroshima University – Professor Mitiko Miura-Mattausch**
 - HiSIM2, HiSIM_HV and HiSIM-SOI
- **Delft University of Technology – Professor Ramses van der Toorn**
 - MEXTRAM and PSP
- **University of California at San Diego – Professor Michael Schroter**
 - HICUM

Charter



To promote the international, nonexclusive standardization of compact model formulations and the model interfaces.

Vision



- Standardized compact models for all major technologies so that customer communication and efficiency can be enhanced.
- Standard interfaces so that models can be tested faster and implemented easier.
- Better compact models for the latest technologies, allowing leading edge design development cycles to shorten.

Strategy



- Examine, promote and standardize compact modeling efforts based upon business needs.
- Encourage developers to dwell on current and near-term problems that will advance compact modeling.
- Provide industry resources for monitoring/mentoring compact model development.
- Provide a standardization process to the compact model developers.

CMC Standards



Compact Models:

- Planar Bulk MOSFETs: BSIM3 (1995)
BSIM4 (2000)
BSIM6 (2013)
PSP (2006)
HiSIM2 (2011)
- LDMOS: HiSIM_HV (2007)
- SOI MOSFETs: BSIMSOI (2002)
HiSIM-SOI (2012)
- BJTs: MEXTRAM (2004)
HICUM (2004)
- Multi-Gate MOSFETs: BSIM-CMG (2012)
- MOS Varactor: MOSVAR (2006)
- Resistors: R2_CMC (2005)
R3_CMC (2007)
- Junction Diodes: DIODE_CMC (2009)

Verilog-A

Other Standards:

- TMI2 Modeling API (2010)
- Standard SPICE Language (2012)

BSIM6

Released May 5, 2013



- The model provides excellent accuracy compared to measured data in all regions of operation.
- It features model symmetry valued for analog and RF applications while maintaining the strong support and performance of the BSIM model valued for all applications since 1996.
- The model has been extensively tested by Compact Model Council member companies to meet the needs of industrial users.

Works In Progress



- ET-SOI Model Standard
- GaN FET Model Standard
- Reliability Modeling API

Member Benefits



- **Members have a say** in what models become a standard.
- **Members** have the opportunity to request enhancements specific to their needs.
- **Members attend** quarterly CMC meetings with leading industry and academic model developers, where they learn about technology, often before they are published in the literature.
- **Members have access** to model beta codes.
- **Members have access** to resistor, varactor and diode model codes.
- All of the information from the meetings is available to **members only** on the CMC website.

Move to Si2: “CMC 2.0”



- For the first time in its 17-year history the CMC will be partnered with an organization that is dedicated to developing EDA standards.
- Expected enhancements:
 - Broader impact through synergies with other Si2 coalitions
 - Improved website and documentation
 - More visibility via Si2’s channels for marketing and publicity
 - Increased operational efficiency

Summary



- The CMC enhances the IC development process
 - Standardizing high-quality device models and simulator interfaces.
 - Providing a forum and mechanism to keep these standards current to industry needs.
- The CMC is a member-driven organization open to any company in the semiconductor business.