

Portable High-Performance Compact Models Using Verilog-A

Tiburon Design Automation, Inc.

October 2003

www.tiburon-da.com

Tiburon-DA

Tiburon Design Automation produces an OVI 2.0 compliant Verilog-A compilation module that is designed to be embedded into existing analog simulation platforms.

Competing against a Built-in

- PERFORMANCE– Verilog–A based compact models must simulate without a big impact on overall simulation speed.
- FUNCTIONALITY – They should look and behave just like built-in devices.
- PORTABILITY – Same definition should be used across simulation platforms.
- AVAILABILITY – To kick start the process, existing compact models need to be available in Verilog–A.

Performance

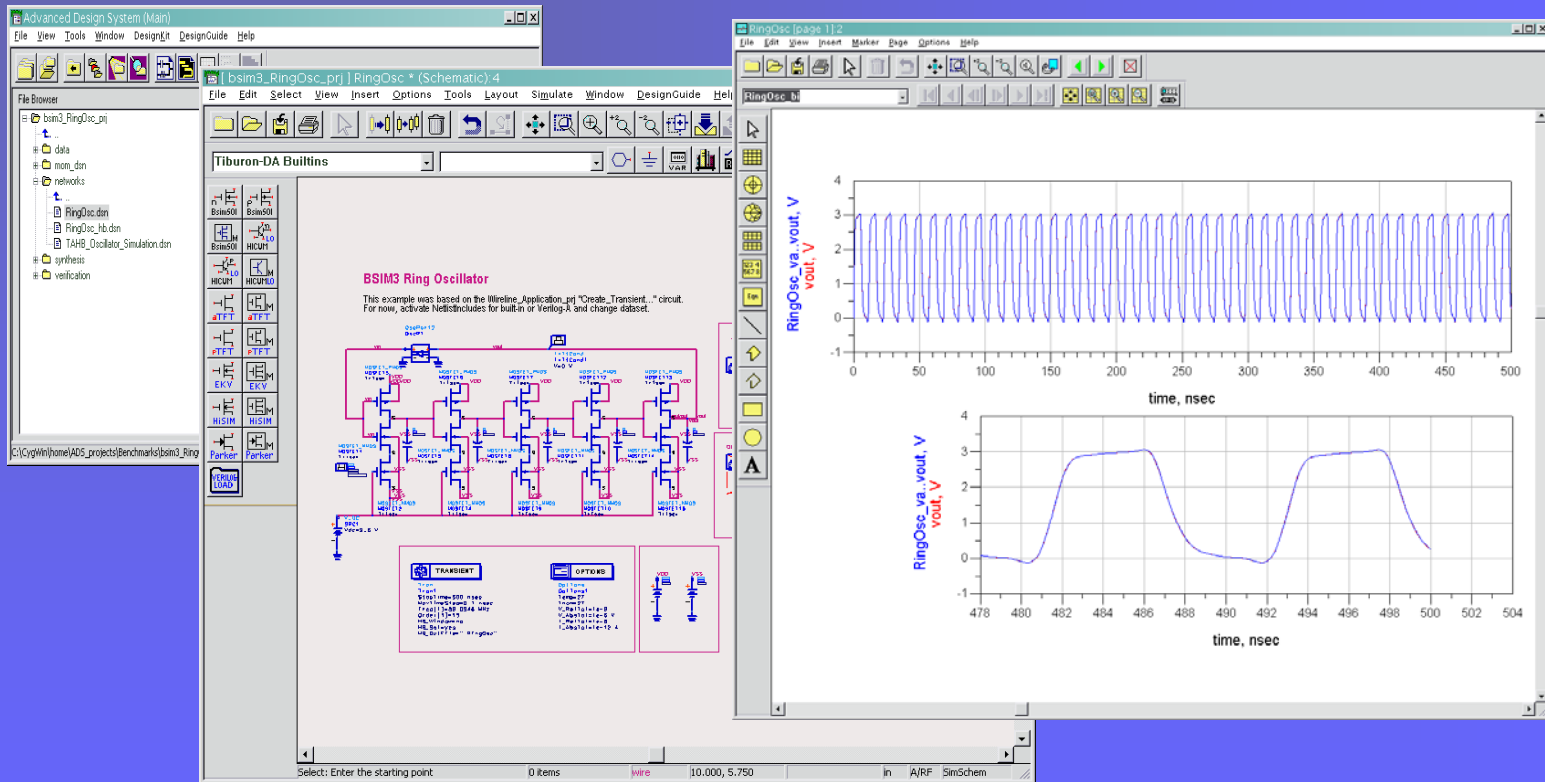
- Example circuits at Tiburon-DA that use the BSIM3 or other similar models show simulation times between 20% and 60% slower than built-ins.
- The ADMS group have showed results which are less than 20% slower than built-ins.
- Recent results from an CICC paper have showed a compiled BSIM3 running faster than built-ins on some circuits.

Functionality

- Verilog-A based devices need to support all analysis types.
- They should use existing netlist syntax for instantiation and allow the use of existing model files.
- They should integrate properly with both UI and post-processing tools so that the average user is unaware that they are defined in Verilog-A.

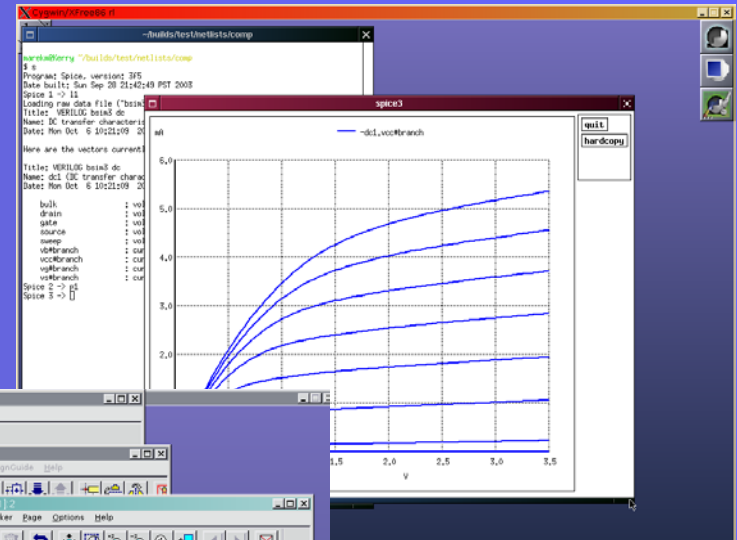
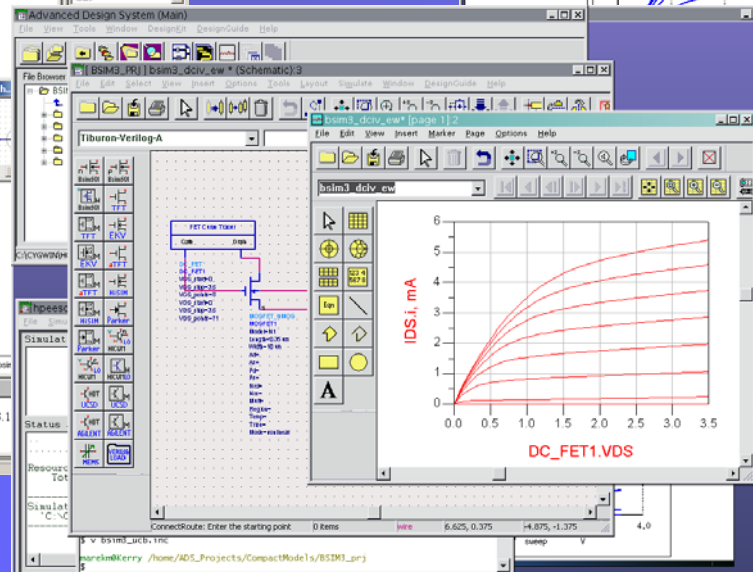
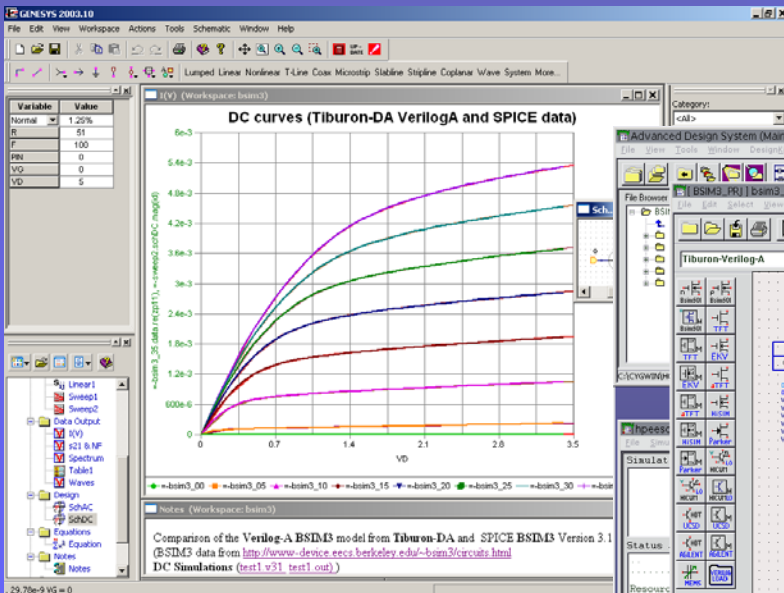
Functionality – An Example

- Ring Oscillator example



Portability – BSIM3

BSIM3 in SPICE, Agilent-ADS, Eagleware Genesys



Compact Model Availability

- BJT : SGP , VBIC , MEXTRAM 504 , HICUM L0 , UCSD HBT .
- MOSFET: BSIM3 , BSIM4 , BSIMSOI , EKV , HiSIM , MOS9 , MOS11 , TFT-ASIA2 , TFT-PSIA2 .
- MESFET: COBRA , Curtice , Parker-Skellern , TOM1 , TOM3 , Statz , Angelov .

www.tiburon-da.com