PrimeSim HSPICE

The gold standard for accurate circuit simulation

Overview

As the 'golden accuracy' cornerstone of the Synopsys PrimeSim Family, HSPICE, now PrimeSim HSPICE, is seamlessly integrated with and empowered by other simulation engines in the continuum. PrimeSim HSPICE is the industry's 'gold standard' for accurate circuit simulation and offers foundry-certified MOS device models with state-of-theart simulation and analysis algorithms. With extensive usage in chip/package/board/backplane signal integrity simulation, cell and memory characterization, and analog mixed signal IC design, PrimeSim HSPICE is the industry's most popular, trusted and comprehensive circuit simulator.

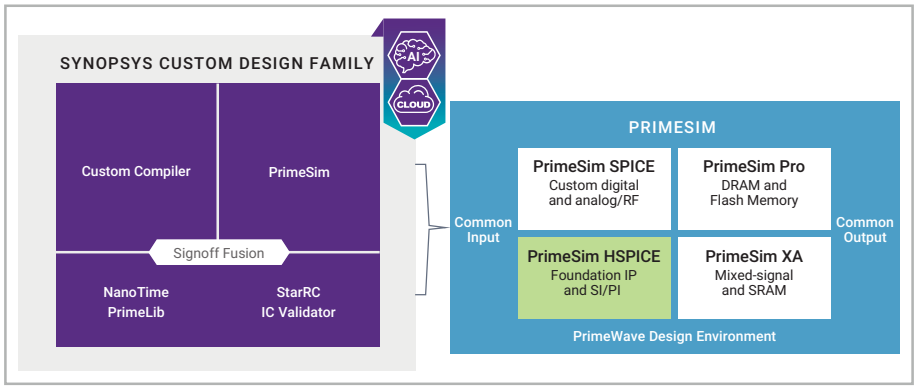

Figure 1: Unified Workflow for Full Lifecycle Verification

To push the productivity frontier even further, PrimeSim HSPICE is fully integrated with the next generation design environment—PrimeWave, and ready to be used on the Cloud, where users can easily run, save and restore their simulations, anywhere and anytime.

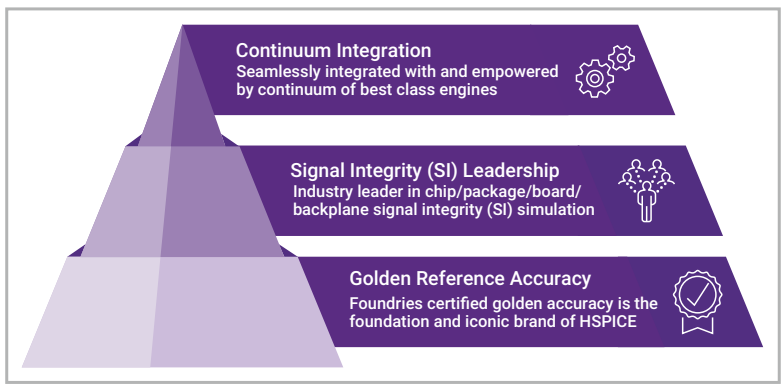

Figure 2: PrimeSim HSPICE Overview

Foundry-Certified Models

Device models are the ingredients for accurate circuit simulation. HSPICE is consistently first to provide new advanced device models and HSPICE models are first to be foundry-certified. HSPICE has consistently engineered leading-edge modeling technology for advanced node CMOS, FinFET and FDSOI processes that ensures the most advanced and accurate set of industry-standard device-model implementations. Synopsys collaborates closely with foundries to ensure that their HSPICE model parameters are timely and accurately validated to their fabrication process. The comprehensive set of HSPICE models have been extensively proven over the broadest set of semiconductor technologies, ranging from the Compact Modeling Council (CMC) standardized models (BSIM, PSP, HiSIM, etc.) on the latest nodes to proprietary models (HVMOS, TFT, etc.) for specialized applications (high voltage, display, etc.).

Chip/Package/Board/Backplane Signal Integrity (SI) Simulation

Key Features

Vender qualified I/O models	Best-in-class analyses	Accurate channel models
• IBIS, IBIS-AMI • Encrypted SPICE netlists	• Transient, Linear, and StatEye • Transistor level accuracy	• S-element for complex packages • W-element for transmission lines

As chip and board speeds continue to increase, new design and verification challenges emerge. PrimeSim HSPICE reveals signal integrity problems caused by jitter, crosstalk, ringing, ground bounce, and other noise sources. With extensive model and element support, PrimeSim HSPICE is the ideal simulator that can satisfy your silicon-to-package-to-board-to-backplane SI simulation needs.

Transient, Linear and Statistical Analysis

PrimeSim HSPICE offers transient, linear and statistical analyses in one environment for easy analysis of what-if scenarios. Output data and waveforms are further explored in PrimeWave where technology-specific compliance and measurements are available.

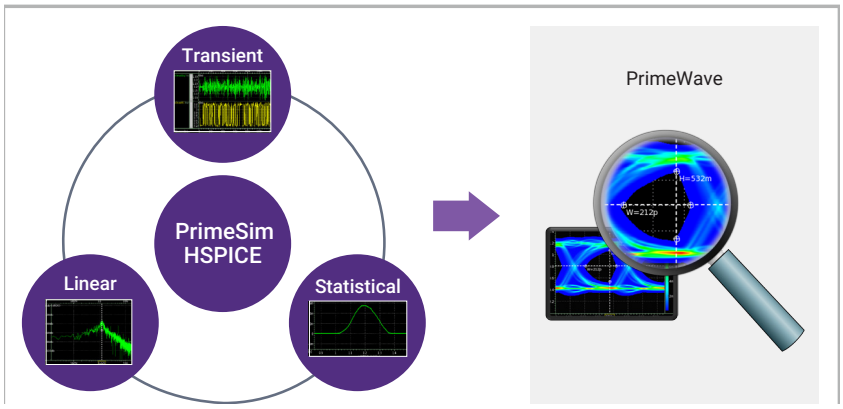

Figure 3: Transient, linear and statistical analysis

Statistical Eye Diagram Analysis (with IBIS AMI)

With PrimeSim HSPICE's cutting edge StatEye analysis, designers can accurately simulate ultra-low bit error rate in a single simulation and display bathtub plots. PrimeSim HSPICE StatEye is widely used in single eneded parallel bus designs such as DDR and differential singaling such as PCIe and USB designs. For accurate modeling of complex equalization systems for SerDes and DDR, StatEye supports the Algorithm Modeling Interface (AMI), part of the IBIS 7.0 specification. Users can run StatEye with any existing HSPICE netlist, capture eye diagram, convert to BER (Bit Error Rate), catch worst pattern and do eye unfolding to visualize equalizer adapataion.

ISO 26262 TCL-1 ASIL D Certified

PrimeSim HSPICE tool can be used in the development of safety-related elements according to ISO 26262, with allocated safety requirements up to a maximum Automotive Safety Integrity Level D (ASIL D), if the tool is used in the context of a tool chain and in compliance of the PrimeSim HSPICE Functional Safety Manual.

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