Analog FastSPICE Platform

Nanometer-scale analog, RF, mixed-signal, and custom-digital circuit design is extraordinarily demanding. Designers must worry about a myriad issues, from tight specifications to intensive physical effects. Successful design demands a fast, full-featured verification platform that never sacrifices accuracy. The Mentor® Analog FastSPICE™ (AFS™) Platform uniquely delivers.

With foundry-certified accuracy by the world’s leading foundries, the AFS Platform delivers nanometer SPICE accuracy > 5x faster than traditional SPICE and > 2x faster than parallel SPICE simulators. For large circuits, the AFS Platform delivers over 50M-element capacity and the fastest mixed-signal simulation with Symphony. For silicon-accurate characterization, the AFS Platform includes the industry’s only comprehensive full-spectrum device noise analysis and integrates with Solido Variation Designer delivering full variation-aware design coverage in orders-of-magnitude fewer simulations, but with the accuracy of brute force techniques. For memory and other array-based circuits, AFS Mega delivers silicon-accurate simulation with greater than 100M element capacity.

Design teams at over 175 semiconductor companies worldwide rely on AFS to design their nm-scale ADCs, DACs, PLLs, high-speed I/O, high-speed clocking, CMOS image sensors, memories, and RFICs. AFS customers include the world’s leading suppliers of consumer electronics, mobile communications platforms, application processors, server ICs, network processors, image sensors, and automotive ICs.

**FEATURES AND BENEFITS**

- **Fastest Nanometer-Accurate Circuit Simulation**
  - Certified to FinFET process by leading foundries
  - > 5x faster than traditional SPICE
  - > 2x faster than parallel SPICE
  - > 50M-element capacity

- **Fastest Mixed-Signal Simulation**
  - Supports all leading digital solvers
  - Best-in-class usability, allowing maximum reuse of verification infrastructure
  - Advanced verification & debug capabilities to improve verification coverage

- **Fastest Full-Spectrum Device Noise Analysis**
  - Includes all device noise sidebands/harmonics
  - Transient noise within 1–2 dB silicon data
  - PSS & pnoise with > 100K-element capacity

- **Fastest Variation-Aware Design & Verification**
  - Improved design quality & time-to-market
  - SPICE accurate, high-sigma verification
  - > 1000x faster than brute force simulation
  - Easy to use & deploy

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As a single executable, AFS operates either standalone from the command line or integrated with industry leading analog design environments. It uses standard compute platforms from a single core up to 32 cores. AFS supports standard SPICE netlist formats, standard foundry models, and produces outputs in industry-standard formats. Design teams can choose the most appropriate license configuration for their needs. AFS Platform features include: AFS Circuit Simulator, AFS Transient Noise Analysis, AFS RF Analyses, Symphony, AFS Mega, and Solido Variation Designer.

**AFS PLATFORM FUNCTIONALITY**

**AFS Circuit Simulator**
- Nanometer SPICE accuracy
- > 50M-element capacity
- > 150 dB transient dynamic range
- > 5x faster than traditional SPICE
- > 2x faster than parallel SPICE
- DC, transient, AC, & noise analyses
- Monte Carlo, alter, & sweep support

**AFS Mega**
- Nanometer SPICE accuracy
- >100M-element capacity
- Compatible with leading digital FastSPICE flows
- DC & transient analyses
- Monte Carlo, alter, & sweep support

**Solido Variation Designer**
- Full coverage PVT & Monte Carlo verification
- SPICE-accurate high-sigma verification
- 1000x faster than brute force simulation
- Full-chip memory & cell-level verification
- Comprehensive verification of full cell libraries
- Powerful design sensitivity, debugging, & optimization

**AFS Transient Noise Analysis**
- Full-spectrum accuracy to noise floor
- Device noise analysis for any circuit type
- > 50M-element capacity
- Validated to within 1–2 dB of silicon

**AFS RF Analyses**
- Shooting Newton (SN) & Harmonic Balance (HB) analyses
- Single-tone PSS, Full-Spectrum noise, oscnoise, & sampled noise
- > 100K element PSS convergence, no maxsideband
- Multi-Tone HB for LNA, PA, Mixer, & TX/RX chain for IPn & PIdB

**Symphony Mixed-Signal Platform**
- Digital HDLs: Verilog, SystemVerilog, VHDL
- SPICE & Verilog-A support
- Monte Carlo, alter & sweep support
- Hi-Z detection & Transient Noise analysis
- Checkpoint-Restore

**EZwave™ Waveform Processor**
- Fast & intuitive waveform viewing
- Customizable waveform calculator
- Broad application-specific measurement tools

**AFS PLATFORM SPECIFICATIONS**

**Input/Output**
- Leading SPICE netlist formats
- DSPF back-annotation
- VCD, vec
- FSDB, tr0, PSF, Nutmeg

**Model Support**
- BSIM3, BSIM4, BSIMSOI, BSIM-CMG
- MOS11, PSP, HiSIM, HiSIM-HV
- MOS1, MOS3, JFET, Diode, Juncap
- S-parameter, W element, bsource
- Verilog-A, Verilog-AMS
- Gummel-Poon, HICUM
- Mextram, VBIC

**AFS PLATFORM SUPPORT**
- Leading EDA design environments
- Standalone command line
- Commercially available Cloud offerings

**Hardware Requirements**
- Single-core or multi-core systems
- Minimum memory recommendation:
  - 2 GB of disk space for simulation
  - 2 GB of physical memory (RAM)
- 2 GB of swap space (virtual memory)
- Operating System: Linux®

For the latest product information, call us or visit: w w w . m e n t o r . c o m