Analog/Mixed-Signal Verification

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

With foundry-certified accuracy by the world’s leading foundries, the AFS Platform delivers nanometer SPICE accuracy 5–10x faster than traditional SPICE and 2–6x faster than parallel SPICE simulators. For large circuits, the AFS Platform delivers over 10M-element capacity and the fastest mixed-signal simulation. For silicon-accurate characterization, the AFS Platform includes the industry’s only comprehensive full-spectrum device noise analysis and a high-productivity Analog Characterization Environment (ACE™)—both of which deliver 5–10x speedup over alternative approaches. For memory and other array-based circuits, AFS Mega delivers silicon-accurate simulation with greater than 100M element capacity.

Design teams at over 150 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.
As a single executable, AFS operates either standalone from the command line or integrated with the industry’s leading analog design environment. 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, AFS Co-Simulation, AFS AMS, AFS Mega, AFS Nano, and ACE.

**AFS PLATFORM FUNCTIONALITY**

**AFS Circuit Simulator**
- Nanometer SPICE accuracy
- >20M-element capacity
- >150 dB transient dynamic range
- >5x–10x faster than traditional SPICE
- 2x–6x 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

**AFS Nano**
- Nanometer SPICE accuracy
- Up to 5K element capacity
- DC, transient, AC, & noise analyses
- Monte Carlo, alter, & sweep support

**Analog Characterization Environment**
- High throughput characterization & regression with AFS MCP & DMCP
- Intuitive GUI with nesting of Monte Carlo, corners, & sweeps
- Design specification driven pass/fail reporting & post-processing
- Statistical distribution analysis

**AFS Transient Noise Analysis**
- Full-spectrum accuracy to noise floor
- Device noise analysis for any circuit type
- >10M-element capacity
- Validated to within 1–2 dB of silicon

**AFS RF Analyses**
- Full-spectrum PSS, pnoise, & oscnoise
- Full-spectrum sampled noise analysis
- No need to specify maxsideband
- >100K element PSS convergence

**AFS Co-Simulation**
- HDL co-simulation with Verilog simulators
- Production-proven on hundreds of circuits
- >5x–10x faster than SPICE-Verilog

**AFS AMS**
- Easy mixed-signal setup
- Supports all leading Verilog simulators
- Maintains existing digital or analog flow
- >5x–10x faster than AMS w/ traditional SPICE
- >2x–6x faster than AMS w/ parallel SPICE
- Simple, powerful configuration support
- Verilog-AMS support only

**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 backannotation
- 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

**Design Flow Integration**
- Industry leading EDA design environment
- Standalone command line

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

For the latest product information, call us or visit: www.mentor.com

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