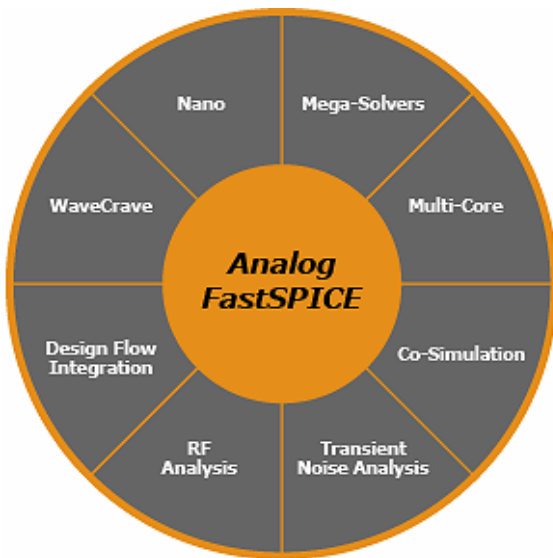


## Analog FastSPICE™ Platform

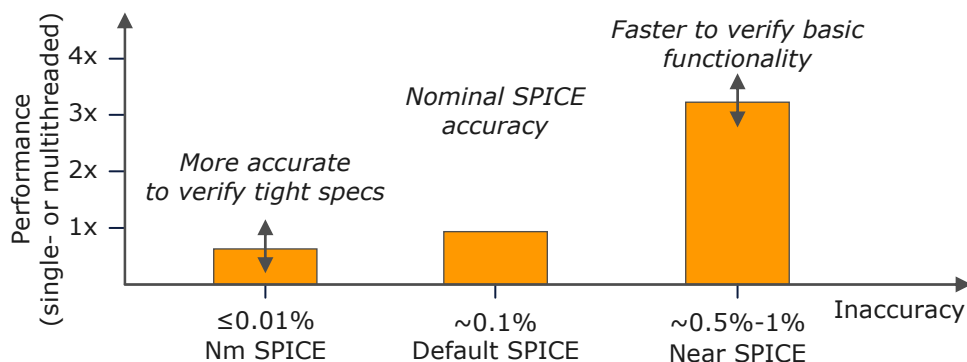
The intense verification challenges of nanometer analog, RF, mixed-signal, and custom digital circuits demand an accurate, fast, and full-featured verification platform. Key requirements include nanometer SPICE accuracy, fast single-core and multi-core simulations, silicon-accurate device noise analysis, and the capacity to handle even the largest post-layout simulations. The *Analog FastSPICE (AFS) Platform* addresses all these requirements in a single executable that seamlessly integrates into the industry's leading design environment.



- 5x-10x faster nm SPICE accurate simulation on a single core
  - 2x-4x more performance with 4-8 core multithreading
  - Certified to 28nm by the world's leading foundries
  - >120 dB transient dynamic range
- Most accurate & efficient analog/RF circuit characterization
  - Full-spectrum device noise within 1-2 dB of silicon
  - Near-linear scaling with increasing number of cores
  - Includes detailed parasitics and device noise effects
- Fastest full-circuit & post-layout transistor-level verification
  - Industry's fastest near-SPICE-accurate functional verification
  - >10M-element capacity with no accuracy degradation
  - Mixed-mode co-simulation with leading Verilog<sup>®</sup> simulators

Over 100 semiconductor companies have adopted the *AFS Platform* for their toughest nanometer verification challenges. Applications include ADCs, DACs, PLLs, high-speed I/O, and RFICs. Design teams rely on the *AFS Platform* for verification tasks from block-level characterization to full-circuit functional verification.

Block-level characterization requires extreme resolution to verify tight specifications. *AFS* delivers nanometer SPICE accuracy, the industry's fastest iterations, silicon-accurate device noise analysis, and ~linear performance scaling with multi-core parallelization. For complex blocks such as ADCs, PLLs, and SerDes, only *AFS* delivers silicon-accurate results including parasitic and device noise effects. For full-circuit functional verification including verifying connectivity and operating modes, *AFS* delivers the industry's fastest near-SPICE-accurate results for circuits up to 10M elements without any simulator tuning.





## Analog FastSPICE Platform

### AFS Circuit Simulator

- Nanometer SPICE accuracy
- 5x-10x faster performance on a single-core
- >10M element capacity
- Analyses:
  - DC (.op and sweep), AC, transient
  - Network analysis, transfer function
  - Monte Carlo, alter, sweep, .measure
  - AC noise analysis (.noise)

### AFS Multi-Core

- Multi-Core Parallel (MCP):
  - Scales ~linearly with number of cores
  - Automated Monte Carlo, corners, sweeps
- Multithreading (MT):
  - 2X-4X faster on 4 to 8 cores
  - Identical results to single-core runs

### AFS Mega-Solvers

- Auto-selected to maximize performance

### AFS Co-simulation

- HDL co-simulation with Verilog<sup>®</sup> simulators

### AFS Transient Noise Analysis

- Device noise analysis for any circuit type
- Validated to within 1-2dB of silicon

### AFS RF Analysis

- Full spectrum PSS, pnoise, and oscnoise
- >100K element PSS convergence
- Impulse sensitivity function (oscnoise)

### AFS Nano

- Nanometer SPICE accuracy for small blocks
- Up to 5K element capacity @ \$1,900
- Analyses:
  - DC, transient, AC, and .noise
  - Network analysis, transfer function
  - Monte Carlo, alter, sweep, and .measure

### AFS Design Flow Integration

- Seamless integration with the leading EDA design environment

### AFS WaveCrave Waveform Processor

- Powerful calculator, script generation, and waveform viewing functions

### Accuracy

With default SPICE tolerance settings (~0.1%), Berkeley Design Automation guarantees that the *AFS Platform* produces identical waveforms to the leading "golden" SPICE simulators. For nanometer circuit verification, AFS delivers foundry-certified nanometer SPICE accuracy with time-domain-based accuracy exceeding 120 dB of dynamic range.

### Performance

The *AFS Platform* delivers nanometer SPICE accuracy 5x-10x faster than any other simulator on a single core. In multithreading mode, AFS delivers an additional 2x-4x speedup when using 4-8 cores. In multi-core parallel mode, performance scales near linearly with the number of cores. Advanced numerical analysis and computational efficiency let the *AFS Platform* achieve this performance without sacrificing accuracy.

### Capacity

A circuit simulator's useful capacity is a function of DC convergence and performance. The AFS Platform robustly converges on circuits with >10M elements. For functional verification tasks that only require near-SPICE accuracy, AFS delivers the industry's fastest near-SPICE-accurate simulation, making full-circuit functional verification practical in a practical timeframe.

### Specifications

- Inputs: leading SPICE netlists and models
- Model support
  - Gummel-Poon, HICUM, Mextram, VBIC
  - BSIM3, BSIM4, BSIMSOI, MOS11, PSP
  - MOS1, MOS3, JFET, Diode, Juncap
  - Verilog-A, S-parameter, W-element
- Outputs
  - PSF ASCII, PSF binary, tr0, FSDB
  - Nutmeg ASCII, Nutbin, Nutbinf
- Operating Systems: Linux or Solaris