

# Virtuoso Analog Design Environment XL

Advanced simulation and analysis with extensive design exploration and verification

Cadence® Virtuoso® Analog Design Environment XL provides all the capabilities found in Analog Design Environment L, while adding all the tests needed to fully verify a design over all operational, process, and environmental conditions. As more analysis is required, users can take incremental advantage of Analog Design Environment GXL capabilities directly or from within Analog Design Environment XL.

## Virtuoso Analog Design Environment

The Virtuoso Analog Design Environment product suite provides all the capabilities required to fully explore, analyze, and verify a design against the user's desired goals, allowing designers to maintain design intent throughout the design cycle. As the industry's leading solution for analog simulation control and management, it allows users to flexibly select the tier that best supports their design goals as they move through the design flow.

Analog Design Environment L provides a quick entry into the analysis process with easy execution of simulations. Analog Design Environment XL extends the L tier capabilities, providing multiple test support; analysis over sweeps, corners, and Monte Carlo; easy reviewing of all results directly; and generation of spec-comparison sheets and datasheets as needed. Analog Design Environment GXL builds on L and XL capabilities by providing targeted tools that aid with key design challenges

with early parasitic analysis, design centering, and designing in multi-technologies.

With an additional option, the user will be able to netlist and simulate partial layouts to allow for detailed analysis of layout-dependent effects.

## Virtuoso Analog Design Environment XL Overview

Virtuoso Analog Design Environment XL is the advanced design and simulation environment for the Virtuoso platform. By supporting extensive exploration of multiple designs against their objective specifications, it sets the standard in thorough, fast, and accurate design analysis and verification.

### Benefits

- Support for high fault coverage of designs with extensive verification over process environmental and operating conditions
- Analysis support of multiple simulators across multiple tests and conditions for thorough design validation, compiling results in a single easy-to-use database

- Simulation and characterization of designs with behavioral models aids in design abstraction
- Support for corners, parametric sweeps, Monte Carlo, and reliability analysis
- Quick color-coded feedback of all results against target specifications to help maintain design intent
- Optimum analysis throughput with simulation distribution and multi-test management across user-preferred load balancing software
- Simplification of design reviews through integral documentation, specifications, measurement results, and waveforms
- Close integration with Virtuoso Schematic Editor for fast test development and debug

### Features

#### Specification-driven design

To accelerate design verification, Virtuoso Analog Design Environment XL combines specification entry and design management in a single unified cockpit. A specification consists of

all required tests, all required analyses, and all required operating conditions for validation against a measured set of goals. With Virtuoso Analog Design Environment XL, development of multiple tests is easy, along with all the different conditions to validate a design's performance against the target specification.

Each Analog Design Environment XL session can be treated as a project, providing access to all the tests, sweeps, corners, scripts, and documentation needed to completely validate a design against the designer's intent.

When combined with the Virtuoso Variation-Aware Design Option, Analog Design Environment XL can be transformed into the central cockpit for analyzing layout as it is being created, giving the user the added benefit of seeing the effects of different layout choices early and providing guidance to the end user on how best to create layouts to negate the layout-dependent effects on the circuit.

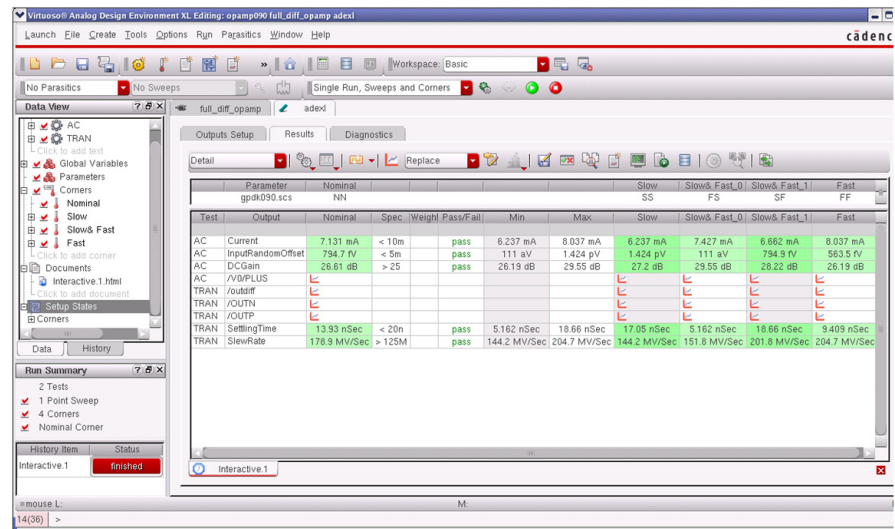
### Flexible simulation management

An overview of all the tests in development is available through the test assistant, which allows easy access to add, delete, and edit all required test configurations and analyses to fully validate a design. These defined tests can be further managed with test configurations that support different testing strategies at different points in the design development/validation flow.

Virtuoso Analog Design Environment XL provides users with a debugging environment for making changes in the set-up for a point and simulating that point for debugging purposes.

By allowing users to create extensive testing, Virtuoso Analog Design Environment XL provides the ability to manage the parallelized simulations with either the internal load balancing system or with an optional third-party solution.

Analog Design Environment XL provides a user interface for defining and specifying operating region expressions using the Operating Region assistant or the Operating Region Specification form. The Operating Region assistant enables



Virtuoso Analog Design Environment XL: multi-test environment

users to quickly specify expressions, while the Operating Region Specification form provides advanced methods for specifying expressions.

### Visual cockpit eases design verification

An overview of all the tests, simulators used, and analysis conducted (along with any defined variables and corners) is listed in easy view on the Data View assistant screen. Results of the latest analysis appear in a tabular view on the right side, with color coding to show at a glance the simulation results that pass or fail against the target specification. The results can be reordered or transposed for better visualization.

Users can easily explore results in more detail by right-clicking any single result or set of results that pops up in Virtuoso Visualization and Analysis XL, which is included in Analog Design Environment XL. In addition, a history of results is automatically maintained so users can quickly go back to see previous results or even results from different test configurations.

### Integral part of the virtuoso custom design platform

Virtuoso Analog Design Environment XL builds upon the features and infrastructure of Virtuoso Analog Design Environment L, providing cohesive operation for the user. As a result, Analog Design Environment XL is able to work

closely with Virtuoso Schematic Editor and Virtuoso Layout Suite for a complete integrated design flow.

## Specifications

### Interactive simulation control

- Integration of Analog Design Environment L capabilities for single test operation
- Design exploration with sweeps, corners, and Monte Carlo analysis
- RelXpert integration for reliability analysis
- Support of matching and correlation constraints from Virtuoso Schematic Editor XL
- Incremental re-simulation
- Creation and tracking of parametric dependencies among tests for more complex analysis
- Integration with Virtuoso Multi-Mode Simulation
- Ability to save different test configurations for different steps in the testing flow

### Visualization and analysis of results

- Creation of specifications directly from simulation results
- Quick overview window of test results against target specification
- Cross-probing and annotation to schematics and layout

- Calculator, OCEAN, MDL, and MATLAB measurement strategies
- Integrated Virtuoso Visualization and Analysis XL for fast waveform analysis
- Integral documentation creation and support for text, HTML, and PDF
- History of prior results with the ability to compare any two sets of data
- Measured results saved along with the tests as a lib/cell/view for easy design management

#### Distributed and batch processing

- Built-in distributed processing, with support for external load balancing software
- Test-specific job policy for efficient use of hardware resources
- Parallel analysis over multiple tests and all required corners
- Batch scripting support through OCEAN XL

#### Third-party simulation support

- All commercial circuit simulators, including those provided by Synopsys, Mentor Graphics, and Agilent
- Users can integrate their own proprietary circuit simulator

#### Design inputs

- OpenAccess data objects
- Cadence proprietary languages: OCEAN and MDL
- SPICE netlists
- Circuit design language (CDL)
- SPICE
- VHDL IEEE 1076-1993
- Verilog IEEE 1364
- PSF and PSF XL waveform formats
- SST2 waveform format
- Cadence SKILL

#### Design outputs

- XML database
- PSF and PSF XL
- SST2
- Comma-Separated Value (CSV)
- Cadence proprietary script language: OCEAN

#### Platform/OS

- x86 Linux
- Sun Solaris
- IBM AIX

#### Cadence Services And Support

- Cadence application engineers can answer your technical questions by telephone, email, or Internet—they can also provide technical assistance and custom training
- Cadence certified instructors teach more than 70 courses and bring their real-world experience into the classroom
- More than 25 Internet Learning Series (iLS) online courses allow you the flexibility of training at your own computer via the Internet
- Cadence Online Support gives you 24x7 online access to a knowledgebase of the latest solutions, technical documentation, software downloads, and more



Cadence is transforming the global electronics industry through a vision called EDA360. With an application-driven approach to design, our software, hardware, IP, and services help customers realize silicon, SoCs, and complete systems efficiently and profitably. [www.cadence.com](http://www.cadence.com)