Keysight EEsof EDA

W2302EP/ET Advanced Design System
Transient Convolution Element

W2500EP/ET Transient Convolution
GT Option

W2312EP/ET Transient Convolution
Distributed Computing 8-pack

KEYSIGHT
TECHNOLOGIES

Introduction

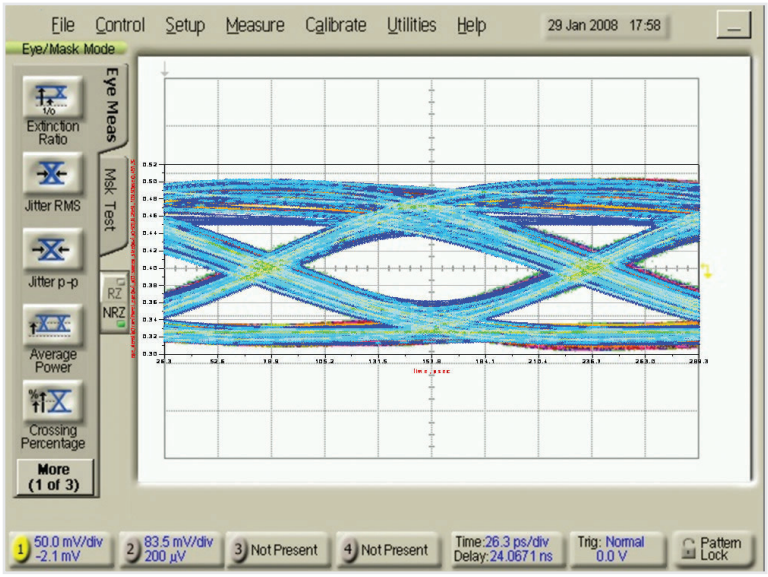


Figure 1. Eye diagram results from the ADS Transient-Convolution Simulator show excellent correlation with measurements, enabling rapid “what if” design space exploration.

The Keysight EEsof EDA—the technology and innovation leader in high-speed, high-frequency electronic design automation—takes SPICE to a new level with the ADS Transient Convolution Element. This simulator is the industry’s fastest signal integrity circuit simulator for multigigabit, high-speed data link design. Multicore processor support and a new, high-capacity sparse matrix solver achieves a three-fold simulation speed improvement for signal integrity simulations.

Design and verification of chip-to-chip multigigabit/s serial links is the morst common application for the Transient Convolution Element. At the very high data rates at which these links operate, signal integrity engineers must take into account physical phenomena such as impedance mismatch, reflections, electromagnetic coupling, crosstalk and microwave frequency attenuation due to the skin effect and dielectric loss tangent. The simulator allows signal integrity engineers to perform “what-if” design space exploration using a circuit-level model that can be verified against measured data, and electromagnetic simulation on the post-layout artwork to arrive at an optimum design while avoiding costly and time consuming prototype iterations.

W2302EP/ET Transient Convolution Element

The Transient Convolution Element includes:

- Industry's fastest SPICE simulator.
- A convolution capability that lets you bring components specified by S-parameters in the frequency domain into a time domain simulation. Proven algorithms ensure passivity and causality control. This is especially important for challenging structures such a long or lossy transmission lines.
- Channel Simulator and Fast Eye Probe features, which allow interactive eye diagram analysis of the transceiver and channel circuitry at million-bit-per-minute simulation rates: about a thousand times faster than conventional SPICE analysis.
- IBIS I/O models, which allow you to incorporate "executable datasheets" from your semiconductor vendors models.
- A Signal integrity verification toolkit, which lets you perform jitter decomposition using the same, tested EZJIT Plus algorithm used in Keysight's test and measurement instruments.
- The Broadband SPICE Model Generator for converting measured or simulated S-parameter models to lumped equivalent or pole-zero representations.

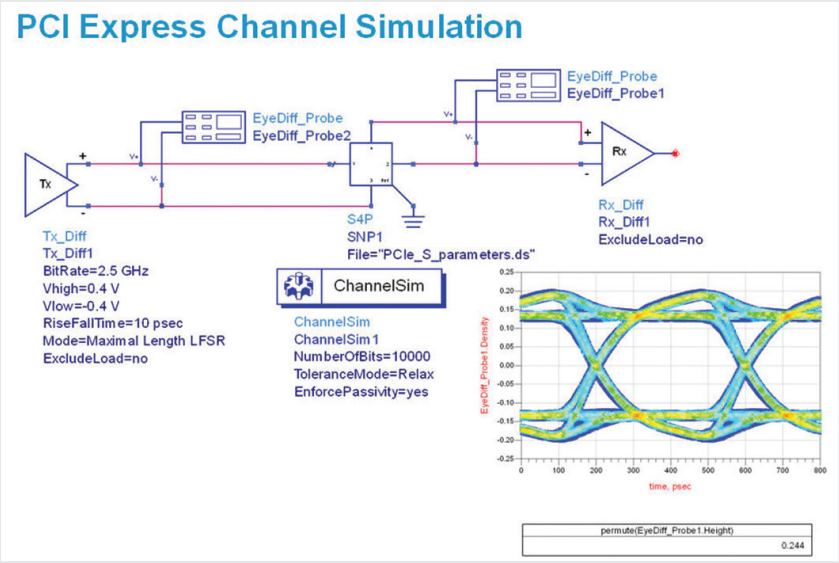


Figure 2. Channel Simulator and Fast Eye Probe provides megabit eye measurements quickly and accurately.

The Transient Convolution Element is unique in that it is not simply a high performance point tool but a set of capabilities integrated into the most complete serial link analysis platform, ADS. With the ADS platform you can move seamlessly between levels of abstraction--system-, circuit-, or physical-level–according to the task at hand.

W2500EP/ET ADS Transient Convolution GT Option

The ADS Transient Convolution GT accelerates signal integrity simulations on workstations that have NVIDIA's Compute Unified Device Architecture (CUDA)-based Graphics Processing Units (GPU). This combination allows signal integrity designers to run these simulations four times faster than on a CPU workstation alone.

W2500EP/ET Transient Convolution GT Element supports NVIDIA Tesla GPU-enabled workstations. For a list of conforming hardware please visit:
www.nvidia.com/object/tesla_computing_solutions.html

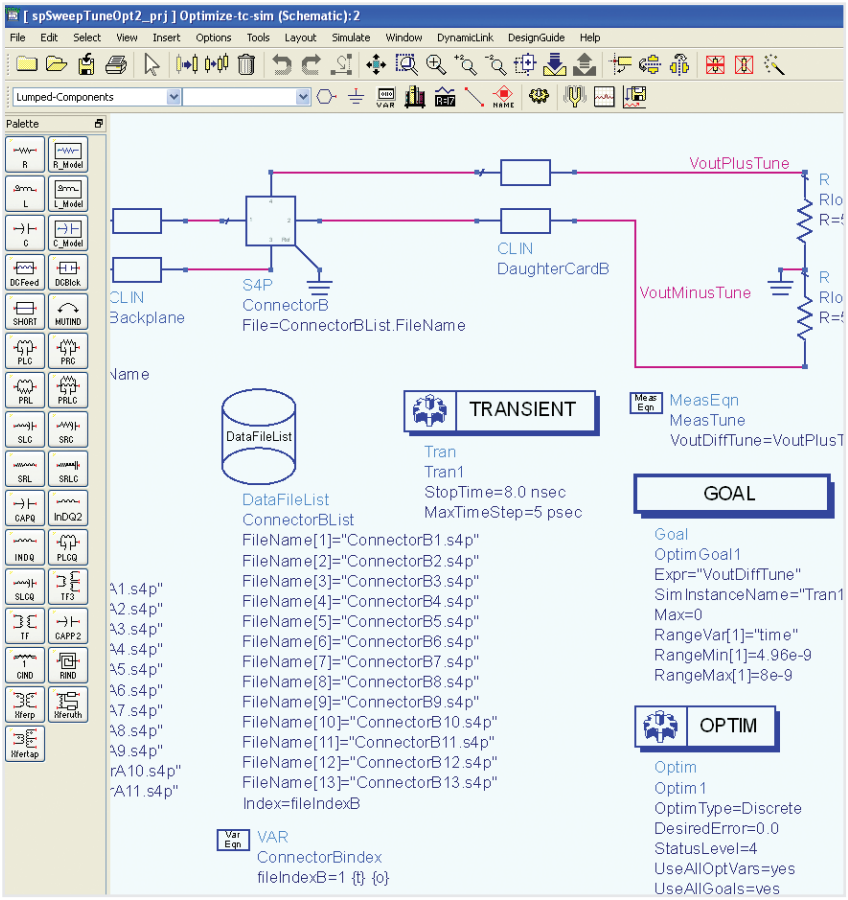


Figure 3. Transient simulation using the DataFileList component lets you quickly and reliably pick the optimum combination of components from your list of candidates.

W2312EP/ET Transient Convolution Distributed Computing 8-pack

The Advanced Design System (ADS) Transient Convolution Distributed Computing 8-pack accelerates signal integrity batch-mode parameter sweeps on workstations connected to a distributed computing cluster. This combination enables signal integrity designers to run these sweeps six to eight times faster than on a single compute node of equal performance. The licenses can be “stacked” in packs of eight, yielding even greater speed up.

This product speeds up parameter sweeps for two combinations:
- Batch Simulation Controller with Transient Simulator, and
- Batch Simulation Controller with Channel Simulator.

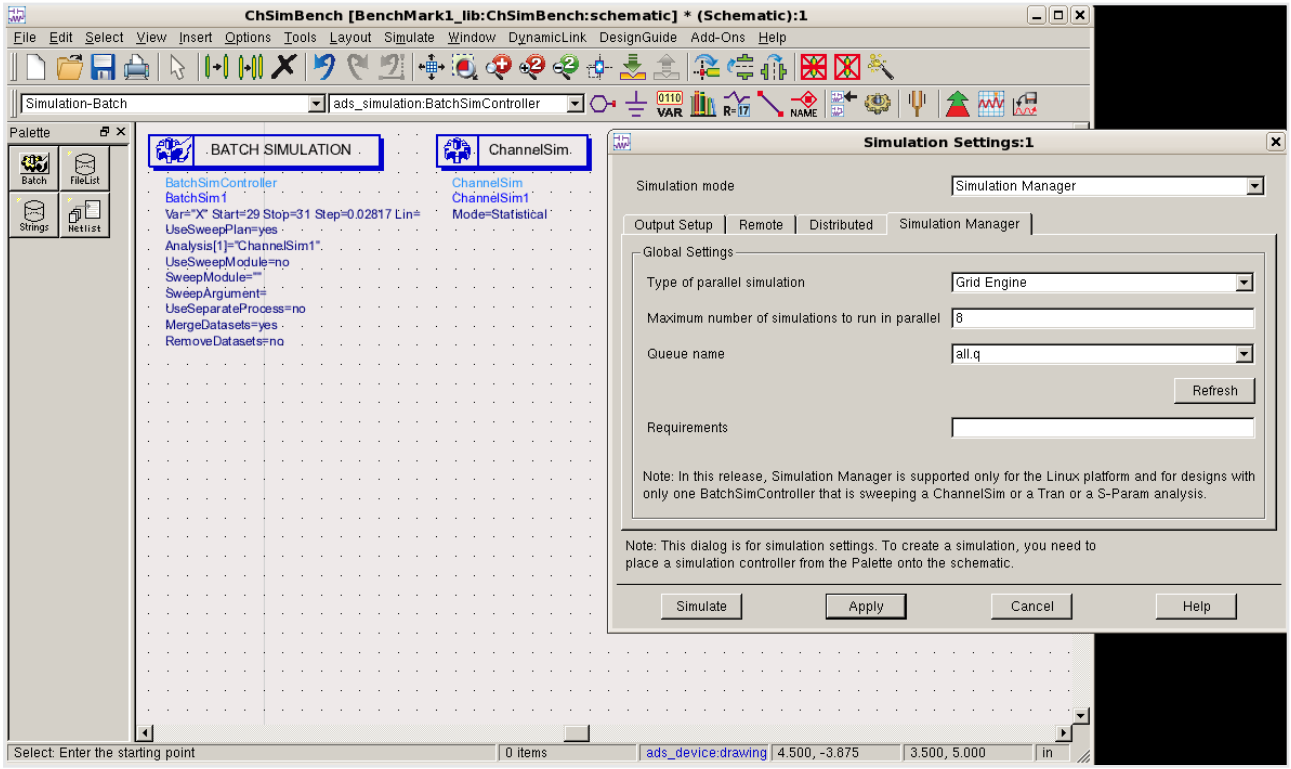


Figure 4. The Transient Convolution Distributed Computing 8-pack is controlled by the Simulation Manager tab of the ADS Simulation Setup menu. This schematic includes parameter sweeps with Batch Simulation Controller with Channel Simulator, but the product also supports Batch Simulation Controller with Transient Simulator (not shown in this figure).

The Transient Convolution Distributed Computing 8-pack presently only supports a configuration where:
- The workstation is running Linux.
- The distributed computing nodes are running Linux with either Load Sharing Facility (LSF) or Sun Grid Engine.

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