

Release Notes
RSoft OptSim, OptSim Circuit and ModeSYS
Version 2017.09

Optical Solutions Group

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SYNOPSYS®

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OptSim, OptSim Circuit and ModeSYS 2017.09, Synopsys' RSoft System Tools, include the changes described in the following sections.

OptSim

The 2017.09 release of OptSim adds:

- Co-simulation with HSPICE. Whether an electrical component or a circuit is on-chip with the photonic circuit or collocated with it, the ability to model both cohesively brings tremendous amount of flexibility and modeling capabilities to designers. With over 25 years of successful design tapeouts, HSPICE is the industry's gold standard and most trusted electrical circuit simulator and offers foundry-certified electrical MOS device models. The 2017.09 version of OptSim and OptSim Circuit adds a powerful cosimulation capability with HSPICE that is available in no other optical communication or photonic circuit simulation tools in the market.
- An application note (pre-supplied project design files and corresponding description) illustrating the use of HSPICE cosimulation.
- Viterbi & Viterbi (V&V) M-th power Carrier Phase Estimation (CPE) algorithm in OptSim DSP Library for MATLAB. Accurate estimation of the phase of the optical carrier in phase-modulated coherent fiber-optic transmission systems is a vital responsibility of the DSP at the receiver. As the order of modulation increases, susceptibility to laser phase noise requires accurate methods for phase estimation. The 2017.09 version of OptSim adds Viterbi-Viterbi M-th power carrier phase estimation algorithm in its DSP library to aid designers with accurate estimation of carrier phase for m-PSK and m-QAM modulation formats.
- An application note (pre-supplied project design files and corresponding description) on the use of the V&V M-th power CPE.
- Ability to add comments/descriptions to component and user-defined variables. Adding comments and descriptions to user-defined and component variables not only aids collaboration, but also helps the original designer recollect the context and definition of the variables during design reviews. The 2017.09 version of OptSim adds this ability to enhance user experience.
- A number of new application notes (pre-supplied project design files and corresponding description) to follow industry trends. The new application notes include (i) Bell curve analysis of coherent WDM systems (ii) ASK-modulated RF subcarrier transmission over fiber (iii) FSK-modulated RF subcarrier transmission over fiber (iv) Analog amplitude modulation (AM) for CATV and microwave RF applications (v) Swept-frequency source for automotive LiDAR (vi) Improving ADC and DAC resolution and electrical-to-logical signal conversion (vii) Modeling transient EDFA dynamics due to gain modulation

OptSim Circuit

The 2017.09 release of OptSim Circuit adds:

- Co-simulation with HSPICE. Whether an electrical component or a circuit is on-chip with the photonic circuit, or collocated with it, ability to model both cohesively brings tremendous amount of flexibility and modeling capabilities to the designers. With over 25 years of successful design tapeouts, HSPICE is the industry's gold standard and most trusted electrical circuit simulator and offers foundry-certified electrical MOS device models. The 2017.09 version of OptSim and OptSim Circuit adds a powerful cosimulation capability with HSPICE that is available in no other optical communication or photonic circuit simulation tools in the market.
- An application note (pre-supplied project design files and corresponding description) illustrating the use of HSPICE cosimulation.
- Support for PhoeniX Software's OptoDesigner elastic connectors. Constraints from packaging and design rule checks (DRC) can impose restrictive routing requirements on schematic-driven layouts. To help overcome these constraints, the 2017.09 version of OptSim Circuit supports PhoeniX OptoDesigner elastic connectors, where the shape and dimensions of the connectors are determined through tight integration with layout generation, and equivalent compact models for these connectors are created and simulated in OptSim Circuit.
- Support for the American Institute for Manufacturing Integrated Photonics (AIM Photonics) Process Design Kit (PDK) version 1.5b and new PDAFlow libraries. The PDK helps save costs in photonic integrated circuit (PIC) design and brings PIC designers a step closer to fabrication through SUNY Poly silicon photonics processes.
- Support for the imec Process Design Kit (PDK) version PDK ISIPP50G. The PDK helps save costs in photonic integrated circuit (PIC) design and brings PIC designers a step closer to fabrication through fabrication facilities supporting imec processes.
- Ability to add comments/descriptions to component and user-defined variables. Adding comments and description to user-defined and component variables not only aids collaboration, but also helps the original designer recollect the context and definition of the variables during design reviews. The 2017.09 version of OptSim Circuit adds this ability to enhance user experience.
- A number of new application notes (pre-supplied project design files and corresponding description) to follow evolving trends in the PIC industry. The new application notes include (i) AIM PDK-based QPSK transmitter (ii) AIM PDK-based 4x4 Benes switch (iii) Half-ring custom PDK-based simulation of a ring resonator circuit

ModeSYS

The 2017.09 release of ModeSYS adds:

- Ability to add comments/descriptions to component and user-defined variables. Adding comments and description to user-defined and component variables not only aids collaboration, but also helps the original designer recollect the context and definition of the variables during design reviews. The 2017.09 version of ModeSYS adds this ability to enhance user experience.