

# Photonic Device Compiler

Photonic device simulation and optimization

Create PDKs and add custom devices to complement a foundry PDK

## Overview

Photonic Device Compiler is the Synopsys solution for photonic IC designers and PDK developers to design, analyze, optimize, and use photonic devices within the Synopsys unified electrical and photonic design platform.

## Introduction

Photonic integrated circuits (PICs) are efficiently simulated using compact models from a model library provided as part of a PDK to represent individual components in the circuit. The lack of complete and mature model libraries is a major impediment to high yields in PIC manufacturing. This is partly due to the current maturity of the ecosystem, and partly because of the wide variety of photonic devices required to address a certain application. PIC technology is vastly different than digital design and largely different than electrical analog mixed signal design. Most PIC components are optimized for a certain function, wavelength, fabrication process, etc.

Photonic Device Compiler provides a wide range of physical simulation methods in a single tool. Photonic Device Compiler also adds automation to take the results of the device design cycle and add it to a custom or personal device library, a PDK, or IP library. You can use these custom devices in the Synopsys PIC software solutions for schematic capture, circuit level simulation, layout, and verification. With Photonic Device Compiler, you use the industry's most comprehensive set of photonic device simulators seamlessly integrated with TCAD Sentaurus™, the industry-leading process and electrical device simulation tool.

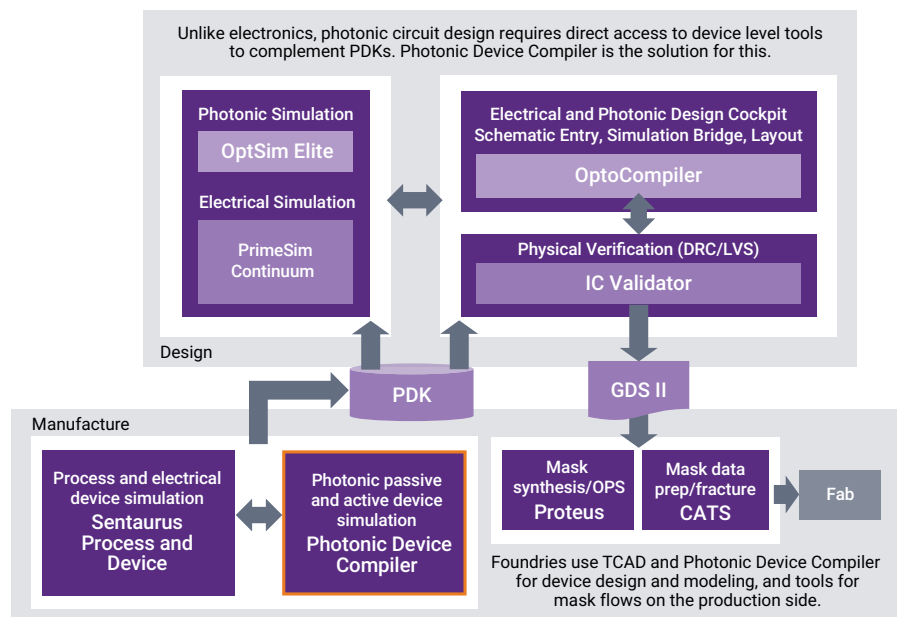


Figure 1: The role of Photonic Device Compiler in the complete Synopsys platform for PIC design and manufacturing

## Photonic Device Compiler Features

- Complete photonic device simulation, analysis, and optimization solution
- Works seamlessly with OptoCompiler™, OptSim™ Elite, and IC Validator
- Enables E/O device level co-simulation with TCAD Sentaurus™
- Enables design of custom components that can be used with foundry PDKs

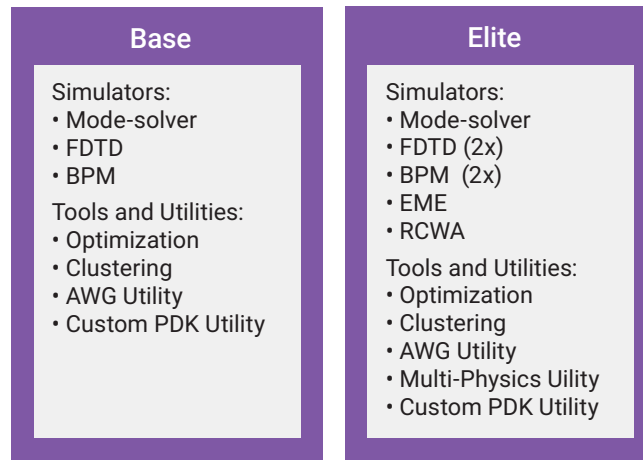


Figure 2: Photonic Device Compiler Tiers

Use Photonic Device Compiler to create and use a custom library with OptoCompiler:

- Use Custom Devices in conjunction with a foundry-provided PDK
- Design, simulate, and optimize passive and active integrated photonics devices for a targeted foundry
- Create symbols, layouts, and simulation models for OptoCompiler and OptSim Elite

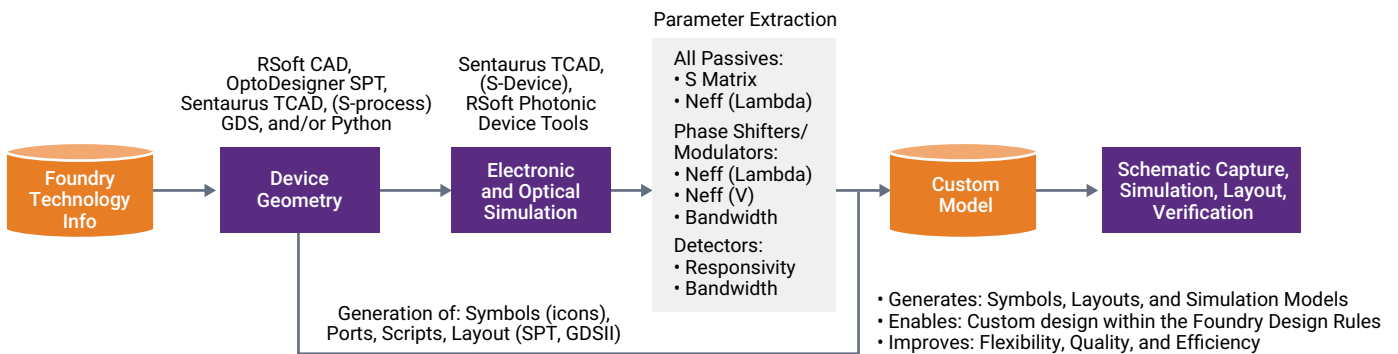


Figure 3: Photonic Device Compiler flow for custom library generation

## Applications

- Passive photonic device design  
Includes waveguides, bends, splitters, couplers, MMIs, AWGs, and polarization devices (rotators, splitters, or a polarization analysis of any of the previously listed devices)
- Active photonic device design  
Includes phase shifters, photodetectors, and modulators
- Assists in the creation of custom device models that can be used with a foundry PDK, to create a new PDK, or to create photonics IP

## Platform Support

To learn more about our System Requirements, visit <https://www.synopsys.com/photonic-solutions/product-system-requirements.html>

- Linux: We officially support Red Hat Enterprise Linux (RHEL) and CentOS 6.6+, 7.1+, and 8+
- Windows 10 64-bit