LightSuite Photonic Compiler

Offering significant productivity improvements to rapidly implement large photonic layouts

Benefits
- Fast, automated PIC layout
- Enables "what if" layouts
- Routes both electronic and optical components
- Works in any OpenAccess layout flow
- Built on standards for OpenAccess and Python
- PDKs are available from multiple photonic foundries in iPDK and Siemens EDA PDK formats

Features
- Electro-optical layout automation
- Multiple optical routers available
- Script-driven, schematic driven, and Design of Experiments flows
- Correct-by-Calibre

Summary
LightSuite™ Photonic Compiler provides significant productivity improvement with the ability to implement a large, integrated photonic layout in minutes that normally would take weeks to manually create.

Capabilities

Integrated photonic layout automation
LightSuite Photonic Compiler provides significant productivity improvement with the ability to implement a large, integrated photonic layout in minutes that normally would take weeks to manually create.

Enables 'what if' layouts
Today's short design schedules drive PIC engineers to quickly finish the layout and then tape out the design. They do not have time to create "what if" layouts to explore the best design. LightSuite Photonic Compiler enables "what if" layouts and the ability to change placement to quickly get a new design rule correct layout in minutes. The resulting layout is Correct-by-Calibre®.

Design flows
The LightSuite Photonic Compiler flow begins with a placed design. Engineers can define placement using a Python script or by schematic. Then, the tool routes both the waveguides and corresponding electrical nets. Multiple optical routing engines are available that the engineer can select from to meet the target implementation. All steps in the implementation are verified by Calibre RealTime, thus producing a design rule checking (DRC) clean design.
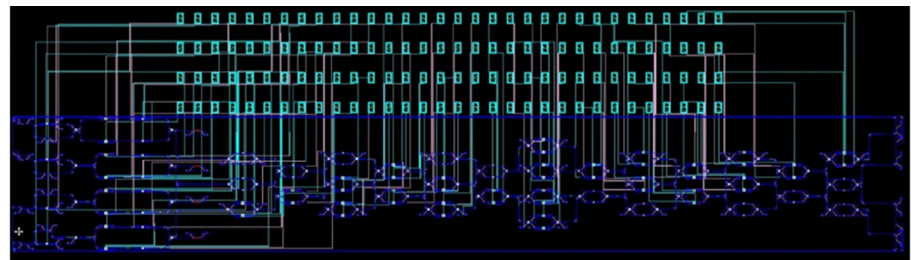

Figure 1: LightSuite Photonic Compiler is the first integrated photonics layout automation tool that simultaneously implements both the photonic and electrical domains, producing a Correct-by-Calibre layout in minutes.

LightSuite Photonic Compiler

Script-driven design
The engineer can control LightSuite Photonic Compiler using a Python script. If desired, the engineer can interact with the tool using a Python IDE. As the design is being created, Calibre RealTime is called at each step to verify DRC correctness. The engineer can visually monitor the layout progress by using the viewer. The completed design is stored in OpenAccess format.

Correct-by-Calibre
LightSuite Photonic Compiler produces a Correct-by-Calibre design. With each placement and route move, Calibre RealTime is called to verify that the placement or route is DRC-correct. Photonic design rules must be written using equation-based design rules in standard verification rule format (SVRF). If the photonic rules are not expressed as eqDRC-based rules, there will be many false DRC violations.

Interoperability and standards
LightSuite Photonic compiler can be integrated into any OpenAccess-based flow. The engineer can use OpenAccess design data for initial placement. The completed design is saved in OpenAccess format which can be read into any OpenAccess-based layout editor. The tool supports Python for its scripting language, which is the language of choice for many photonic engineers.

Foundry support
LightSuite Photonic Compiler supports both Siemens EDA formatted process design kits (PDKs) and the industry standard, interoperable PDK (iPDK). PDKs are currently available from multiple photonic foundries.
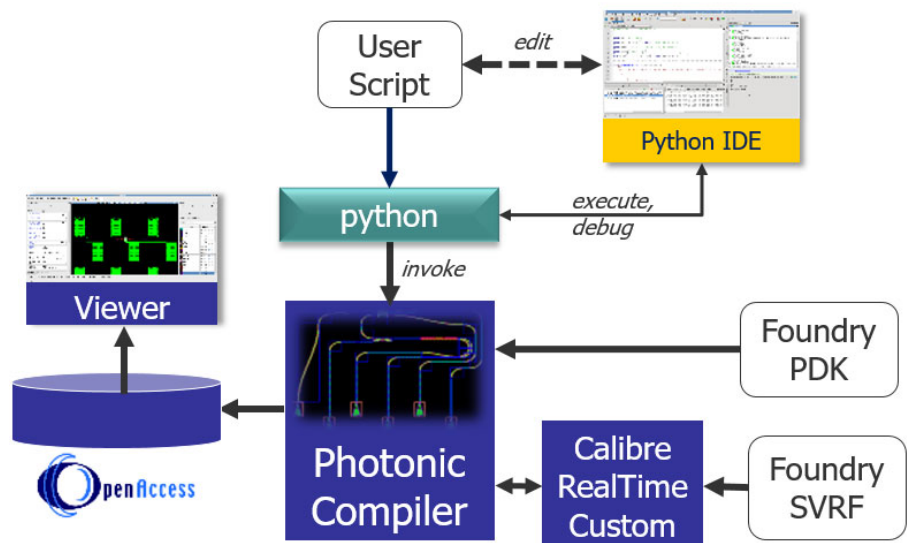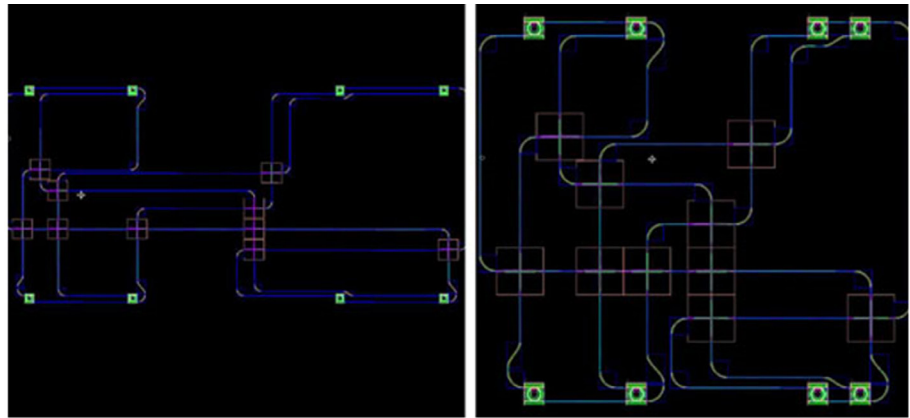

Figure 2: The LightSuite Photonic Compiler design flow.

Requirements
LightSuite Photonic Compiler is supported on Linux®. The tool requires a license of Calibre RealTime Custom. A Python-based integrated development environment (IDE) is optional.