

The Design of Components for Silicon Integrated Nano-Photonics

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It has now become accepted, that Silicon technology in the form of SOI (Silicon-On-Insulator) can fulfill the requirements for nano-photonic integration, including many of the common opto-electronic components. High speed electrically driven optical modulators, are routinely integrated into Silicon. All the other customarily required opto-electronic components are available now in Silicon, as well. Continuous wave optical power is provided from off-chip, just as dc power is currently provided from off-chip.

Silicon technology provides a high index contrast between the Si and SiO₂ as required for photonic crystals. I will review the different optical component functions that are required in an integrated system, and describe which of them benefit from a spatially periodic structure.