

Article Overview

The main coupling methods in silicon photonics are grating couplers (vertical/off-plane) and edge couplers (in-plane/butt coupling), with advanced techniques like inverted tapers and transformation optics enhancing efficiency and bandwidth.

Grating Couplers (Vertical/Off-Plane Coupling)

Grating couplers use diffractive elements patterned on the silicon surface to redirect light from an optical fiber vertically into the chip. They allow wafer-scale testing and provide alignment tolerance, making them suitable for large-scale manufacturing. Advantages include compact size and flexible coupling positions, while limitations involve relatively low coupling efficiency (typically

The graph below shows the total number of articles in optical coupling techniques in silicon photonics across all publications each

Silicon photonics has emerged as a critical enabling technology for a diverse range of applications, from high-speed

Silicon photonics is defined as an optical technology that integrates photonics and electronics to enhance high-speed

Silicon photonics has evolved into a pivotal technology driven by advancements in optical communication, computing,

Complementary metal-oxide-semiconductor-integrated silicon photonics offers a practical path forward by combining

Submicron scale structures with high index contrast are key to compact structures for realizing photonic integrated

In addition, technology for efficient transmission of light through chips is discussed including guided mode and free form

To overcome this issue, the scientific community has proposed different solutions over the last 20 years, which can be schematically

Common Coupling Methods in Silicon Photonics Technology

Here we present an overview of coupling technologies, optimized designs, and a tutorial on manufacturing techniques for inverted

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In this paper, we review the current research progresses made on grating couplers, starting from their fundamental

In this paper, we review the current state-of-the-art of optical couplers for photonic integrated circuits, aiming to give to

In this paper, we review recent progress in the packaging of silicon photonic circuits from on-CMOS wafer-level

Silicon photonics has drawn increasing attention in the past few decades and is a promising

Index Terms--Silicon photonics, integrated optics, integrated optoelectronics, optical design techniques, light sources, flip-chip

Most sophisticated PICs to date contain over 1000 optical components on single, monolithic, InP-based chip. Application of

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