

Optical Devices Grating Couplers



Traffic
command center



Baseball
broadcast booth



Large Scale
Stage Display



Military Command



News Center



Radio & Television
Broadcast





Overview

In this paper, we review the current research progresses made on grating couplers, starting from their fundamental theories and concepts. Surface grating coupler is a preferred candidate that provides flexibility for circuit design and reduces effort for both fabrication and alignment. The built-in particle swarm optimization tool is used to maximize the coupling efficiency, and a compact model in INTERCONNECT is created using the component S-parameters. ce between its high-performance integrated waveguide devices and optical fibers or free-space optics.



Optical Devices Grating Couplers

Arrayed waveguide grating (AWG)

Open the `Arrayed_waveguide_grating_varFDTD.lms` file that contains the basic AWG setup. Edit the AWG analysis group, set `simulation_type` to 1 (input coupler)

Fiber Bragg Gratings - FBG, index modulation, filters,

Fiber Bragg gratings are reflective structures in the core of an optical fiber with a periodic or aperiodic perturbation of the effective refractive index.



Grating Coupler

A grating coupler is defined as a device that uses a periodic structure to diffract light in and out of an optical fiber by directing vertically incident light into waveguides through the principle of diffraction.

Out-of-Plane Focusing Grating Couplers for Silicon Photonics

We present the design methodology, simulation and experimental characterization of out-of-plane FGCs as layer couplers for photonic integration with AOS MRAM technology.

Optimization design of a polarization-independent grating coupler on

The demonstrated grating coupler can serve as a polarization-independent optical fiber interface on lithium-niobate-on-insulator and facilitate on-chip polarization diversity

Grating coupler - Ansys Optics

Design a grating coupler connecting a single-mode fiber on the surface of a photonic chip to an integrated waveguide. The built-in particle swarm optimization tool is

Sub-wavelength gratings in silicon photonic devices for mid-infrared

Here, we review the development of sub-wavelength grating-based devices for mid-infrared silicon photonics and discuss how they can be exploited for spectroscopic and sensing devices.



Grating Couplers on Silicon Photonics: Design Principles

In this paper, we review the current research progresses made on grating couplers, starting from their fundamental theories and concepts. Then, we conclude various methods to improve their

Co-packaged optics (CPO): status, challenges, and

Grating couplers possess a relatively wide alignment tolerance with small optical bandwidth and high polarization sensitivity. Therefore, unlike edge

High-performance full-etched fiber-to-chip grating

Currently, the high-performance and fabrication-friendly fiber-to-chip grating couplers operating at 3-4 μm wavelength band are still desired urgently.



Wafer and chip-level characterization of edge-coupled photonic

This process utilizes a coupling structure that integrates grating couplers and spot-size converters for efficient testing both at the chip and wafer levels, respectively. By leveraging wafer

Two-Dimensional Apodized Grating Coupler for Polarization

A four-port grating coupler with etched square holes is proposed and demonstrated for surface-normal and polarization independent coupling. Benefiting from the perfectly vertical coupling and 1×4 power



Progress of Grating Couplers for Light Exchange

This paper conducts a systematic study on grating couplers, first outlining their research background, reviewing current research progress and

SLANTED BURIED DIFFRACTIVE GRATINGS FOR OPTICAL

These special optical elements are used in head-mounted displays for augmented reality and virtual reality. They have slanted buried diffractive gratings that help display images effectively. The gratings

High-efficiency nano-integrated input/output based on shallow-etched

Deep-etched gratings can achieve high coupling efficiency but may cause nonnegligible damage to the waveguide device. In this study, we develop a shallow-etched grating



Efficient silicon nitride grating coupler with distributed

In this paper we have designed, fabricated and characterized a high efficiency Silicon nitride grating coupler at 1490 nm. Distributed Bragg reflectors

A three-dimensional polarization-insensitive grating coupler tailored

Efficiently coupling light from optical fibers into photonic integrated circuits is a key step toward practical photonic devices. While a notable coupling can be achieved by out of plane couplers



All AI Data Center Interconnects Will Be Optical Within 5 Years

CMOS execs need to understand optics and how to integrate with it Optics is taking over all high-bandwidth interconnects in the data center. GPUs/XPUs, switches, and other devices will

Subwavelength grating periodic structures in silicon-on-insulator: a

Abstract: We report on the experimental demonstration and analysis of a new waveguide principle using subwavelength gratings. Unlike other periodic waveguides such as line-defects in a 2D photonic

Low-loss fiber grating coupler on thin film lithium niobate



Lithium niobate is a versatile material for optical devices due to its wide transparency window, large refractive index, and excellent electro-optic, acousto

Highly Efficient Polarization-Insensitive Grating Couplers

The thin-film lithium niobate platform, which is emerging as a promising photonic integration platform, currently lacks a polarization-insensitive

Review Grating Couplers on Silicon Photonics: Design Principles

research progresses made on grating couplers, starting from their fundamental theories and concepts. Then, we conclude various methods



Imec expands opportunities for photonic integrated circuits and

Existing devices include silicon waveguides, plasma-enhanced chemical vapor deposition (PECVD) silicon nitride (SiN) waveguides, undercut structures, grating couplers, ring modulators, germanium

Design and Optimizing Backside Grating Couplers in Si-Photonics

Grating couplers are based on the concept of utilizing a periodic grating structure to couple light between a waveguide and a free-space optical mode. This approach takes advantage of the diffraction

Inverse Design Optimization



GDS pattern extraction for inverse designed devices using contours method Broadband Grating Coupler Design: Bandwidth vs. Peak Efficiency Topology

A Compact Apodized Grating Coupler for Perfectly Vertical Coupling

INTRODUCTION ght to and from optical fibers, photodetectors, lasers, and so on. In recent years, the application of GCs for free-space optical (FSO) communication has received more attention, because

High-efficiency self-focusing metamaterial grating coupler in silicon

In this work, we present a novel grating coupler architecture for silicon nitride photonic integrated circuits that utilizes an amorphous silicon (a -Si) overlay.



Grating Coupler Design for Low-Cost Fabrication in

The grating coupler is a versatile light-transference technique which can be tested at wafer level, not requiring specific fiber terminations or additional

Photonic 'ski jump' steers light beam from silicon chip

Although grating couplers have become more sophisticated in the past 20 years, they nevertheless have many problems: they operate over a

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