Low-temperature resistant optical directional couplers for cloud computing

Overview

In this work, a silicon nitride bent directional coupler with large bandwidth, large fabrication tolerance, and low thermal sensitivity is proposed and demonstrated through simulation analysis and experiments. Mini-Circuits' directional couplers offer over 300 models in stock with coupling coefficients from 5. 6 dB up to 40 dB and ultra-wide bandwidths spanning DC to 43. Our directional coupler selection comprises a variety of technologies including Low Temperature Co-fired Ceramic (LTCC). Given their widespread use, accurate characterization of directional couplers is crucial for en-suring optimal performance. However, it is challenging due to the coupling between fibers and waveguides, which is highly sensitive to alignment and fabrication imperfections. This high-precision control was enabled by.

Article Content

Robust Characterization of Integrated Photonics Directional Couplers

To address these challenges, we propose a novel direct measurement technique that offers greater robustness to variations in optical interfaces, while by-passing extinction ratio

Non-volatile programmable directional couplers for high-integration

Here, we demonstrate a non-volatile programmable directional coupler based on low-loss Sb2Se3 phase-change material, featuring an insertion loss of 0.3 dB. The device achieved 197 distinct non

All-optical switching in epsilon-near-zero asymmetric directional ...

Abstract We propose an all-optical switch based on an asymmetric directional coupler structure with epsilon-near-zero (ENZ) layer.

Design and simulation of ultra-low loss triple tapered asymmetric ...

Optical coherence tomography (OCT) is a promising imaging modality for clinical. Its certain limitations such as size and complexity are rather challenging wherein exploiting integrated

Directional Coupler

A directional coupler is defined as a device that couples only to waves traveling in a specific direction, allowing for the measurement of forward and reverse power levels in transmission

Directional Coupler

Beam splitters and directional couplers are fundamental optical devices used for signal splitting and combining in photonic networks. There is a high demand for compact, low-loss, and

Broadband and Low-Loss Silicon Photonic Directional Coupler for

An ultra-broadband, compact and CMOS-compatible arbitrary ratio power splitter that is based on a directional coupler is proposed on the silicon-on-insulator (SOI) platform.

All-optical switching in epsilon-near-zero asymmetric directional coupler

We propose an all-optical switch based on an asymmetric directional coupler structure with epsilon- near-zero (ENZ) layer. The nonlinear optical properties the of ENZ layer are analyzed by ...

Tunable silicon photonics directional coupler driven

A compact directional coupler fabricated on a silicon photonic platform is presented, with a power-splitting ratio that can be tuned through a transverse temperature

Design of All-Optical Directional Coupler Using Plasmonic ...

The proposed 10-dB directional coupler and 3-dB directional coupler feature good energy confinement, ultra-compact, and low propagation loss, which has potential applications in photonic integrated

Highly efficient and selective integrated directional couplers for ...

The design and fabrication of a compact, low-loss, broadband directional coupler (DC) based duplexer operating in the near-infrared (NIR) region are demonstrated.

Broadband Silicon-On-Insulator directional couplers using a ...

Broadband Silicon-On-Insulator (SOI) directional couplers are designed based on a combination of curved and straight coupled waveguide sections.

Broadband Silicon Nitride Power Splitter Based on Bent Directional ...

In this work, a silicon nitride bent directional coupler with large bandwidth, large fabrication tolerance, and low thermal sensitivity is proposed and demonstrated through simulation analysis and experiments.

Temperature-dependent coupling characteristics in a silicon photonic ...

The study proposed in this paper introduces a novel methodology to theoretically analyze how temperature influences the coupling characteristics of waveguide directional couplers within two

Tunable Directional Couplers for High Contrast Optical Meshes

We describe the operation, design, and fabrication of MEMS-tunable silicon-photonics directional couplers, with potential for smaller footprint, less sensitivity to fabrication errors, and

Broadband and Low-Loss Silicon Photonic Directional

One of the basic components in SiPh is the directional coupler (DC), which plays an important role in signal monitoring with the requirement of low

Directional Couplers

RF directional couplers from Mini-Circuits provide flat coupling over ultra-wide bandwidths up to 43.5 GHz with high directivity and power handling up to 250W.

Multi-Octave All-Dielectric Directional Coupler Using

The realization of this directional coupler necessitated the development of an integrated quasi-optical substrateless silicon platform that is

Grating-coupler-based optical proximity coupling for

Waveguide grating based optical proximity couplers were developed with low loss and large optical bandwidth to enable multi-layer intra/inter-chip

Low-Loss and Broadband Nonvolatile Phase-Change Directional Coupler ...

Request PDF | Low-Loss and Broadband Nonvolatile Phase-Change Directional Coupler Switches | An optical equivalent of the field-programmable gate array (FPGA) is of great interest to

Study of Directional Couplers for Optical Qubit Quantum Operations

Abstract In this work, nanophotonic circuits with directional couplers are studied, which, along with phase shifters, are one of the main elements for creating circuits of a linear optical

The Optical Directional Coupler | Springer Nature Link

This chapter presents a detailed discussion of optical directional couplers, which is one of the important components of integrated quantum photonic circuits. Coupled mode theory is used to analyze two

An ultracompact optical directional coupler based on lithium niobate ...

However, to the best of our knowledge, there is no report on optical directional coupler based on LN photonic wires, although varieties of waveguide couplers have been widely proposed or

Chapter 5 The Optical Directional Coupler

Abstract This chapter presents a detailed discussion of optical directional couplers, which is one of the important components of integrated quantum photonic circuits. Coupled mode theory is used to

Low-loss and broadband non-volatile phase-change

Previous programmable photonic devices relying on the weak, volatile thermo-optic or electro-optic effect usually suffer from a large footprint and high

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: https://lwazipm.co.za
Email: info@lwazipm.co.za
Phone: +27 82 415 6392
Address: 15 Oxford Street, Rosebank, Johannesburg, 2196, South Africa

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