

# **Extinction ratio of germanium-silicon modulators**





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### **Review of Silicon Photonics Technology and Platform Development**

To integrate such PIN photodetectors into the silicon photonics platform, the hetero-epitaxial germanium (Ge) is generally considered to be the ideal intrinsic region material as it has strong absorption in the

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### **On-chip silicon electro-optical modulator with ultra-high extinction**

Here, the authors demonstrate an ultra-high extinction ratio electro-optical modulator on silicon and its application for DAS.

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## **(PDF) Germanium electro-absorption modulator for power efficient**

We report a novel evanescent-coupled germanium electro-absorption modulator with a small active area of  $16 \mu\text{m}^2$  giving an extinction ratio of  $\sim 10$  dB for a wavelength range of 1580 -

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## **Silicon Mach-Zehnder modulator of extinction ratio**

Silicon Mach-Zehnder modulators with reduced series resistance in lateral PN junction rib-waveguide phase shifters for enhanced high-speed

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## **High-speed germanium-based waveguide electro-absorption modulator**



Germanium-based waveguide electro-absorption modulators are reported in C- and L-band wavelength operation at 56Gb/s (NRZ-OOK) with extinction ratio of >3dB at 2V peak-to-peak and insertion loss

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## **Understanding the Dynamic and Static Extinction Ratios**

Explore the differences between static and dynamic extinction ratios in Ge electro-absorption modulators (EAMs). Learn how optical input power and self-heating

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## **(PDF) Hybrid Silicon and Lithium Niobate Modulator**

Hybrid Silicon and Lithium Niobate Modulator Shihao Sun, Mingbo He, Mengyue Xu, Shengqian Gao, Siyuan Yu, and Xinlun Cai (Invited Paper)

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## **On the dynamic and static extinction ratio of germanium electro**

We compare dynamic and static extinction ratios of germanium electro-absorption modulators (EAM) and their dependency on optical power. We discuss that the common figure of merit, the quotient of

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## **Slow-light silicon modulator with 110-GHz bandwidth**

Design of slow-light silicon modulator with ultrahigh bandwidth and compact size. (A) The detailed device geometry and doping configuration of the

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## **Calculating modulation response**

In this document, we will describe the procedure for determining the modulation



response using the effective index of the waveguide. The effective index can be

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## **64 Gb/s O-Band GeSi Quantum-Confined Stark Effect Electro**

A wafer-scale analysis of static insertion loss (IL) and extinction ratio (ER) is presented, showing IL down to 7.5 dB with ER of 5 dB for a 36.8  $\mu\text{m}$  long device, at drive voltages of 2 V peak-to-peak.

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## **Extremely high extinction ratio electro-optic modulator via frequency**

In particular, they are required for the control and manipulation of atomic systems such as atomic clocks and quantum computers. Typical integrated electro-optic modulators operating at

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## **Effect of Germanium Doping on the Performance of a Silicon Optical**

In this paper, the transfer characteristics of a germanium doped silicon Mach-Zehnder modulator (MZM) have been plotted and compared with a silicon MZM. The germanium doped silicon MZM can

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## **Design and fabrication of a novel evanescent germanium electro**

An electro-absorption (EA) modulator holds distinct advantages over the silicon Mach-Zehnder interferometer (MZI) modulator by having lower energy consumption, a smaller footprint on

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## **OpenLight and Tower Semiconductor Demonstrate**



Home » Press Releases OpenLight and Tower Semiconductor Demonstrate 400G/lane Modulators Built on Silicon Photonic Wafers for Data

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## **Compact, High Extinction Ratio Silicon Mach-Zehnder Modulator with**

An integrated silicon photonic MZM modulator with a slow-wave architecture to reduce V<sub>π</sub>L is presented. This structure achieves an 80% enhancement in extinction ratio and has a 14GHz

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## **Monolithic electro-optic platform on silicon with bandwidth of**

We demonstrate a scalable C-band silicon photonic platform monolithically integrating ultra-high speed germanium-silicon electro absorption modulators and fin photodiodes.

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## **Compact, High Extinction Ratio Silicon Mach-Zehnder Modulator with**

Compact, High Extinction Ratio Silicon Mach-Zehnder Modulator with Corrugated Waveguides Reza Hosseini<sup>1\*</sup>, Aroutin Khachaturian<sup>2</sup>, Mircea Catuneanu<sup>1</sup>, Parham Porsandeh Khial<sup>2</sup>, Reza Fatemi<sup>2</sup>,

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## **10 Gbit/s Silicon modulator and germanium detector chip-to**

Experimental results of a high-speed silicon optical modulator based on carrier depletion in a p-p-n diode and Germanium photodetectors are presented. 10 Gbit/s data transmission is obtained

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## **On the dynamic and static extinction ratio of germanium electro**



We have found that the extinction ratio (ER) of an electroabsorption modulator integrated with a distributed feedback laser strongly depends on the incident power to the modulator.

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## **(a) Measured extinction ratio and insertion loss of a Ge**

We present the design and fabrication of a waveguide-based Ge electro-absorption (EA) modulator integrated with a 3  $\mu\text{m}$  silicon-on-insulator (SOI) waveguide. The

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## **Understanding the Dynamic and Static Extinction Ratios**

Introduction Germanium electro-absorption modulators (Ge EAMs) are promising candidates for energy-efficient and high-speed optical transmitters in silicon

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## **Improved extinction ratio of Mach-Zehnder based optical modulators**

Silicon based optical modulators with improved extinction ratio (ER) of 25 dB were demonstrated on complementary metal oxide semiconductor (CMOS) platform. It was proposed that

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## **Thermo-Optical Analysis of O-Band GeSi Quantum Confined Stark**

The optimum extinction ratio (ER) undergoes a red shift and is preserved at higher temperatures. The self-heating of the device due to optical absorption is assessed using finite element (FE) simulations,

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**PCM3\_R1**



Using a PCM with higher refractive index change upon phase-transition and lower extinction coefficient can increase the turnability of the designed filter. However, this would decrease

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## **Design and analysis of graphene slot waveguide micro-ring modulator**

Highlights o The paper introduced a novel design of a graphene ring modulator that balances the trade off between extinction ratio and bandwidth. o The research demonstrates that the

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## **Conference title, upper and lower case, bolded, 18 point type, centered**

We performed a detailed reliability study of GeSi Electro-Absorption Modulators integrated in a silicon photonics platform using a wide range of stress and performance parameters.



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