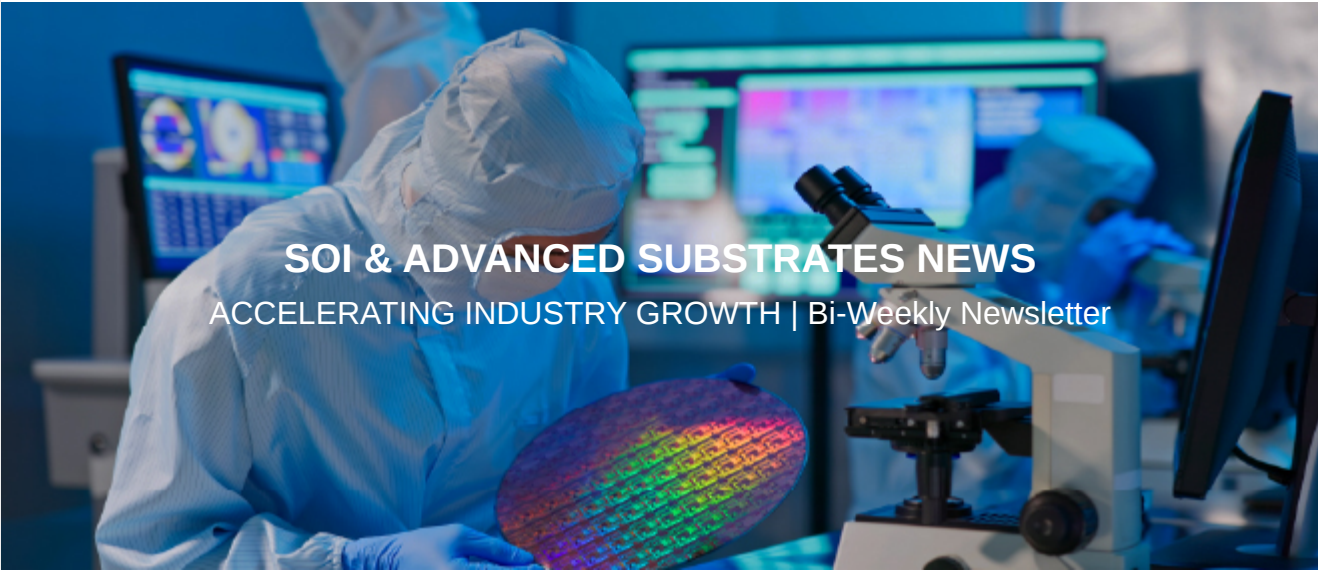




SOI & ADVANCED SUBSTRATES NEWS
ACCELERATING INDUSTRY GROWTH | Bi-Weekly Newsletter

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FEATURED IN THIS EDITION

STMICROELECTRONICS BREAKS THE 20NM BARRIER FOR COST-COMPETITIVE NEXT-GENERATION MICROCONTROLLERS

STMicroelectronics announces an advanced process based on 18nm Fully Depleted Silicon-on-Insulator (**FD-SOI**) technology with embedded phase change memory (ePCM) to support next-generation embedded processing devices.

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A BROADBAND MILLIMETER-WAVE 5G LOW NOISE AMPLIFIER DESIGN IN 22 NM FULLY DEPLETED SILICON-ON-INSULATOR (FD-SOI) CMOS

Using GlobalFoundries' 22FDX technology, this paper presents a broadband LNA design in 22 nm fully depleted silicon-on-insulator (**FD-SOI**) CMOS using bandwidth extension techniques to improve input matching and wide gain bandwidth.

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ULTRA-COMPACT AND EFFICIENT PHOTONIC WAVEGUIDE BENDS WITH DIFFERENT CONFIGURATIONS DESIGNED BY TOPOLOGY OPTIMIZATION

A topology optimization-based approach is proposed here for designing optimal single-mode waveguide bends in a 220 nm silicon-on-insulator (**SOI**) platform with ultra-compact sizes. The aim is to minimize the propagation loss along the bending or corner regions.

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HYBRID GRAPHENE-SILICON ARRAYED WAVEGUIDE GRATINGS FOR ON-CHIP SIGNAL-FREQUENCY CONVERSION

This study presents the design and simulations of a novel integrated device concept enabling a frequency conversion of a broad signal. The device is based on a silicon-on-insulator (**SOI**) platform on which an arrayed waveguide grating is designed for operation at the center wavelength of $\lambda = 1800$ nm.

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SOI ECOSYSTEM NEWS

COHERENT ANNOUNCES THE WORLD'S FIRST 6-INCH INDIUM PHOSPHIDE SCALABLE WAFER FABs

The company expects to transition the bulk of its production from 3-inch indium phosphide (InP) to 6-inch InP in the next few years to fully leverage the benefits of larger wafer size, higher yield, and improved performance that will be required to provide a sustainable competitive advantage in its communications and sensing markets.

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EUROPEAN PHOTONICS FOUNDRY OPENS FOR PROTOTYPING

The photonicsFAB photonics foundry consortium is led by X-Fab and aims to help the European silicon photonics value chain by providing early access to R&D and small-scale manufacturing through technology partners. Other consortium partners include imec, LIGENTEC, SMART Photonics, CEA-Leti, PHIX Photonics Assembly and Luceda Photonics.

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HIGH-EFFICIENCY METAMATERIAL-ENGINEERED GRATING COUPLERS FOR SILICON NITRIDE PHOTONICS

In response to the rise of hybrid photonic platforms, the adoption of multi-layer grating arrangements has emerged as a promising strategy to enhance the performance of Silicon nitride (Si3N4) couplers. This study presents a novel approach to developing high-efficiency fiber-chip interfaces for the silicon nitride integration platform for a wide range of applications.

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MONOLITHIC BACK-END-OF-LINE INTEGRATION OF PHASE CHANGE MATERIALS INTO FOUNDRY-MANUFACTURED SILICON PHOTONICS

Monolithic integration of novel materials without modifying the existing photonic component library is crucial to advancing heterogeneous silicon photonic integrated circuits. Here researchers show the introduction of a silicon nitride etch stop layer at select areas, coupled with low-loss oxide trench, enabling incorporation of functional materials without compromising foundry-verified device reliability.

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COMPOUND SEMICONDUCTOR

NIO'S IN-HOUSE DEVELOPED SIC MODULE SEES MAJOR PROGRESS TOWARDS MASS PRODUCTION

The module saw its first C-sample roll off the line, marking a further step in the maturity of Nio's in-house developed SiC module and a step closer to mass production, the module's production supplier, United Nova Technology, announced.

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WOLFSPEED TOPS OUT WORLD'S LARGEST, MOST ADVANCED SILICON CARBIDE FACILITY

Located in Chatham County, North Carolina, the John Palmour Manufacturing Center will produce 200mm silicon carbide wafers, significantly expanding Wolfspeed's materials capacity, and meet the demand for next generation semiconductors critical to the energy transition and AI.

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SILICON CARBIDE INNOVATION ALLIANCE TO DRIVE INDUSTRIAL-SCALE SEMICONDUCTOR WORK

To advance the potential of this semiconductor, Penn State recently launched the Silicon Carbide Innovation Alliance, a coalition of industry leaders, academic institutions and government support with a focus on becoming the nation's central hub for research, development and workforce training in silicon SiC crystal technology.

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DEEP-POTENTIAL ENABLED MULTISCALE SIMULATION OF GALLIUM NITRIDE DEVICES ON BORON ARSENIDE COOLING SUBSTRATES

By constructing the accurate and high-efficient machine learning interatomic potentials, researchers performed multiscale simulations of the gallium nitride (GaN)-boron arsenide (BAs) heterostructures. Ultrahigh interfacial thermal conductance of 260 MW-m²K⁻¹ is achieved, which lies in the well-matched lattice vibrations of BAs and GaN.

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SEMI BLOG

SEMI STARTUPS FOR SUSTAINABLE SEMICONDUCTORS ANNOUNCES 2024 SEMIFINALISTS

Building on the success of the first two years of the Startups for Sustainable Semiconductors (S3) program, and seeking to spur more green technology innovation for our industry, the industry sponsors, in partnership with SEMI, launched the third year of the program in January by inviting startups, academics, and innovators with compelling ideas for advancing semiconductor industry sustainability to apply to participate.

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SEMI NEWS HIGHLIGHT

SEMI UNIVERSITY 1-YEAR ANNIVERSARY: MORE LEARNING OPPORTUNITIES, GREATER REACH

As SEMI University (SEMI U) celebrates its one-year anniversary, learners can now access over 575 courses in multiple languages and engage with an expanding learning community of over 3,300 learners in over 55 countries, with all courses developed or instructed by industry experts. All told, 75 of courses in Japanese, 90 in Chinese, and 23 in Korean have been added to the platform.

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