



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

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FEATURED IN THIS EDITION

SUB-VOLT HIGH-SPEED SILICON MOSCAP MICRORING MODULATOR DRIVEN BY HIGH-MOBILITY CONDUCTIVE OXIDE

Researchers at Oregon State University successfully demonstrated the integration between silicon photonics and high-mobility transparent conductive oxide material to create a highly efficient ITiO-gated MOSCAP silicon microring modulators. The passive Si microring resonator was fabricated on a **SOI** wafer using Intel's photonics fab.

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INVESTIGATION OF SUBMERGED MEMS ULTRASONIC SENSORS FOR UNDERWATER OBSTACLE AVOIDANCE APPLICATION

A novel CMUT structure based on silicon-silicon bonding technology is proposed for the obstacle avoidance application of underwater miniature fish-shaped robots. The **SOI** wafer is directly bonded to the silicon wafer through Si-Si bonding at 300 °C under a vacuum environment.

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LC TANK OSCILLATOR BASED ON NEW NEGATIVE RESISTOR IN FDSOI TECHNOLOGY

A novel back-gate control technique using UTBB-**FDSOI** transistors is proposed to effectively reduces the short channel effect and drain-induced barrier lowering effects in analog cells. By reducing these effects, it can decrease the size of the analog cells while maintaining their performance and reliability.

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SOLUTION-INDUCED DEGRADATION OF THE SILICON NANOBELT FIELD-EFFECT TRANSISTOR BIOSENSORS

To ensure the long-term stability and performance of Field-effect transistor (FET)-based biosensors in practical applications, this study delves into the documented degradation of silicon nanobelt FET (NBFET) biosensors induced by buffer solutions. Commercially available SOI wafers were used as the substrate to form the silicon NBFET sensors.

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SOI ECOSYSTEM NEWS

NAVITAS AND SHINRY ACCELERATE NEW-ENERGY VEHICLE DEVELOPMENTS WITH NEXT-GEN POWER SEMICONDUCTORS

The joint lab accelerates development projects, with leading-edge GaN technology combining with innovative system-design skills and engineering talent to enable unprecedented high power density, lightweight, efficient designs that translate to faster charging and extended range, with faster time-to-market.

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FORMATION TECHNIQUES FOR UPPER ACTIVE CHANNEL IN MONOLITHIC 3D INTEGRATION: AN OVERVIEW

This paper provides an overview of the potential technologies for forming active channel layers in the upper device layers of Monolithic 3D integration, particularly for complementary metal-oxide-semiconductor devices and digital circuits. Techniques are for polysilicon, single crystal silicon, and alternative channels, which can solve the temperature issue for the top layer process.

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MPI CORPORATION'S ADVANCED SEMICONDUCTOR TEST DIVISION ACHIEVES FULLY TRACEABLE RF CALIBRATION BREAKTHROUGH UP TO 110 GHZ

Collaborating with the Physikalisch-Technische Bundesanstalt (PTB), the division has successfully achieved full traceability in characterizing a commercially available calibration substrate up to 110 GHz and set a new industry benchmark.

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ROADMAPPING THE NEXT GENERATION OF SILICON PHOTONICS

What will it take to increase the proliferation of silicon photonics from millions to billions of units shipped? What will the next generation of silicon photonics look like? What are the common threads in the integration and fabrication bottlenecks that silicon photonic applications face, and which emerging technologies can solve them? This article attempts to answer these questions.

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SEMI BLOG

CHIP INDUSTRY FUN FACTS

Do you know how much gold is embedded in smartphones? Roughly 34 kilograms in 1 million mobile phones! Beyond gold, the value of raw materials in global e-waste was roughly US\$57 billion in 2019. The good news is that advances in e-waste mining is making technology more eco-friendly and boosting materials supplies for chips.

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SEMI NEWS HIGHLIGHT

SEMICONDUCTORS ACCELERATE THE ARTIFICIAL INTELLIGENCE REVOLUTION

Five years ago, SEMI published an article predicting that Artificial Intelligence (AI) would change everything – and it has! AI has moved out of labs and taken popular imagination by storm. It is now a hot topic of discussion everywhere, from family dining tables and corporate boardrooms to corridors of government.

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EVENTS

Standardizing the Semiconductor Manufacturing Backend

Taming the Wild West of semiconductor backend manufacturing

Webinar
Feb. 22, 2024
3pm - 4pm PST

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