



SOI & ADVANCED SUBSTRATES NEWS

ACCELERATING INDUSTRY GROWTH | Bi-Weekly Newsletter

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QUANTUM STARTUP DIRAQ TAPS GLOBALFOUNDRIES TO FORGE SILICON-BASED QUANTUM CHIPS

Diraq said it has designed sample chips that will be manufactured this year by GlobalFoundries using its 22nm 22FDX **Silicon-on-Insulator** process technology. The move with GlobalFoundries is to demonstrate that Diraq's silicon qubit design can be implemented using standard production processes with existing production tools and integrate with standard CMOS transistors.

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DESIGN, FABRICATION, AND CHARACTERIZATION, AND SIMULATION OF ALN-BASED PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCER FOR SONAR IMAGING APPLICATIONS

To address the requirements of sonar imaging, an AlN PMUT with an optimized ratio of 0.6 for the piezoelectric layer diameter to backside cavity diameter is proposed in this paper. A sample AlN PMUT is designed and fabricated with the **SOI** substrate-based bulk MEMS process.

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ULTRA-LOW-POWER COMPACT NEURON CIRCUIT WITH TUNABLE SPIKING FREQUENCY AND HIGH ROBUSTNESS IN 22 NM FDSOI

In an effort to design biologically plausible spiking neuron circuits while restricting power consumption, we propose a new subthreshold Leaky Integrate-and-Fire (LIF) neuron circuit designed using 22 nm **FDSOI** technology.

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SOITEC EXTENDS PARTNERSHIP WITH UMC TO PROVIDE LEADING ENGINEERED SUBSTRATES FOR INDUSTRY'S FIRST 3D IC SOLUTION FOR RF-SOI

Building on a collaborative relationship that dates back to 2013, Soitec and UMC are proud to highlight their latest partnership in **RF-SOI** technology, delivering key innovations that drive the performance and efficiency of 5G applications worldwide.

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SOI ECOSYSTEM NEWS

TI UNVEILS INDUSTRY'S FIRST GAN IPM TO ENABLE SMALLER, MORE ENERGY-EFFICIENT HIGH-VOLTAGE MOTORS

The new GaN IPM addresses many of the design and performance compromises engineers typically face when designing major home appliances and heating, ventilation and air-conditioning (HVAC) systems. The DRV7308 GaN IPM enables more than 99% inverter efficiency, optimized acoustic performance, reduced solution size and lower system costs.

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ONSEMI UNVEILS COMPLETE POWER SOLUTION TO IMPROVE ENERGY EFFICIENCY FOR DATA CENTERS

As data centers become increasingly power-hungry to support the tremendous processing requirements of AI workloads, the need for boosting energy efficiency is paramount. The powerful combination of onsemi's latest generation T10 PowerTrench® family and EliteSiC 650V MOSFETs create a solution that offers unparalleled efficiency and high thermal performance in a smaller footprint for data center applications.

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EFFECTIVELY DETECTING CARDIAC MYOGLOBIN BY USE OF BOUND STATES IN THE CONTINUUM IN SILICON NITRIDE GRATINGS

This work demonstrated a numerical analysis, nanofabrication, and optical characterization for the realization of the optical sensor device based on accidental or Friedrich–Wintgen bound states in the continuum phenomena. The system consists of a silicon nitride subwavelength grating on top of a fused silica substrate immersed in liquid environment.

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2.1 MM MULTI-QUANTUM WELL LASER EPITAXIALLY GROWN ON ON-AXIS (001) INP/SIO2/SI SUBSTRATE FABRICATED BY ION-SLICING

A cost-effective method to achieve a 2-3 μm wavelength light source on silicon represents a major challenge. In this study, researchers report on 2.1μm lasers produced on indium phosphide on insulator (InPOI) on silicon (Si) substrates, using ion-slicing and molecular beam epitaxy.

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COMPOUND SEMICONDUCTOR

GEELY AUTO AND STMICROELECTRONICS SIGN LONG-TERM SIC SUPPLY AGREEMENT

Under this multi-year agreement, STMicroelectronics will supply Geely with SiC power devices for mid-to-high-end BEVs. In addition, Geely and STMicroelectronics have established an Innovation Joint Lab, which will focus on developing smart, electrified, and connected automotive technologies.

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INFINEON COMPLETES THE FIRST PHASE OF 200MM SIC WAFER FAB IN KULIM

Infineon plans to officially open the Kulim 3 fab module in August, with SiC production starting by the end of 2024. The fab is at the heart of a \$100bn plan by the Malaysian government to boost chip production in the country.

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HOER POWERTRAIN AND ETH ZURICH INITIATE INNOVATIVE GAN MULTILEVEL INVERTER DEVELOPMENT PROJECT

hofer powertrain announced the commencement of a groundbreaking research project in collaboration with ETH Zurich, focusing on the development of a state-of-the-art multilevel Gallium Nitride (GaN) traction inverter. The core objective of the project is to rapidly develop an advanced multilevel traction inverter integrating GaN switches.

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OBSERVATION OF 2D-MAGNESIUM-INTERCALATED GALLIUM NITRIDE SUPERLATTICES

Researchers observe that Mg-intercalated GaN superlattices can form spontaneously by annealing a metallic Mg film on GaN at atmospheric pressure. This marks the first instance of a two-dimensional metal intercalated into a bulk semiconductor, with each Mg monolayer being intricately inserted between several monolayers of hexagonal GaN.

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SEMI BLOG

SEMICONDUCTOR PRIDE – CREATING A MORE INCLUSIVE AND EQUITABLE WORKFORCE

Multiple reports have shown that Gen Z (people born between 1996 and 2010) adults are increasingly identifying as LGBTQ+, a stark contrast from previous generations. This underscores the importance of attracting and retaining LGBTQ+ talent. The formation and strategy of Semiconductor PRIDE is an important next step toward creating a more inclusive industry.

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SEMI NEWS HIGHLIGHT

Q1 2024 GLOBAL SEMICONDUCTOR EQUIPMENT BILLINGS EDGE DOWN 2% YEAR-OVER-YEAR, SEMI REPORTS

Global semiconductor equipment billings contracted 2% year-over-year to US\$26.4 billion in the first quarter of 2024, while quarter-over-quarter billings dropped 6% during the same period, SEMI announced in its Worldwide Semiconductor Equipment Market Statistics (VWSEMS) Report.

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