



SOI & ADVANCED SUBSTRATES NEWS

ACCELERATING INDUSTRY GROWTH | Bi-Weekly Newsletter

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Join the SOI community to engage on the topic of **SOI: DEVELOPING APPLICATIONS WITH IMPROVED PERFORMANCE** – focused on the Automotive sector – at SEMICON Europa, November 16. [Learn more here](#)

FEATURED IN THIS EDITION

ADVANCEMENTS IN COMPLEMENTARY METAL-OXIDE SEMICONDUCTOR-COMPATIBLE TUNNEL BARRIER ENGINEERED CHARGE-TRAPPING SYNAPTIC TRANSISTORS FOR BIO-INSPIRED NEURAL NETWORKS IN HARSH ENVIRONMENTS

Diverse nonvolatile memory devices with various device structures and materials recently have been proposed for electronic synapses. This study demonstrates high-reliability silicon channel conductance modulation and proposes in-memory computing capabilities for artificial neural networks using silicon-on-insulator (SOI)-based charge-trapping synaptic transistors.

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TECHNOLOGY AND DESIGN STUDY OF 3D PHYSICS-BASED INDUCTOR ON FDSOI IN GHZ-RANGE

The inductor plays a serious role in RF reflectometry readout circuit for spin qubits. This study investigates several ways to improve the quality factor and (or) the inductance by evaluating the possibility to add magnetic materials around an inductor integrated into the BEOL of CMOS technology. Performance boost evaluation is done through 3D numerical simulations of an inductor integrated on an SOI substrate made in a 28 nm UTBB FDSOI technology.

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LOW-LOSS OPERATION OF SILICON-ON-INSULATOR INTEGRATED COMPONENTS AT 2.6–2.7 μM

Development of mid-infrared photonics is gaining attention, driven by a multitude of sensing applications requiring increasingly compact and cost-effective photonics systems. To this end, low-loss operation of μm-scale silicon-on-insulator (SOI) photonic integration elements is demonstrated for the 2.6–2.7 μm wavelength region.

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HIGH-PERFORMANCE GRATING COUPLERS ON 220-NM THICK SILICON BY INVERSE DESIGN FOR PERFECTLY VERTICAL COUPLING

Efficient grating couplers (GCs) for perfectly vertical coupling are difficult to realize due to the second-order back reflection. In this study, apodized GCs (AGCs) are presented for achieving perfectly-vertical coupling to 220 nm thick silicon-on-insulator (SOI) waveguides in the C-band. The results demonstrate the potential of AGCs for achieving high-performance coupling in the C-band on the SOI platform.

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SOI ECOSYSTEM NEWS

INFINEON COMPLETES ACQUISITION OF GAN SYSTEMS, BECOMING A LEADING GAN POWER HOUSE

Both companies' complementary strengths in IP and application understanding as well as a well-filled customer project pipeline put Infineon in a position to address various fast-growth applications.

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JABIL INVESTS IN THE FUTURE OF AI WITH INTEL SILICON PHOTONICS TRANSCEIVER DEAL

Jabil will take over the manufacture and sale of Intel's silicon photonics-based pluggable optical transceiver product lines and the development of future generations of such modules, the company announced.

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ONSEMI COMPLETES EXPANSION OF SILICON CARBIDE PRODUCTION FACILITY IN SOUTH KOREA

onsemi announced the completed expansion of its state-of-the-art, world-largest silicon carbide (SiC) fabrication facility in Bucheon, South Korea. It is learnt that the fab will be able to manufacture more than one million 200 mm SiC wafers per year at full capacity.

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HETEROEPITAXIAL GROWTH OF B-GA2O3 THIN FILMS ON SINGLE CRYSTALLINE DIAMOND (111) SUBSTRATES BY RADIO FREQUENCY MAGNETRON SPUTTERING

Researchers based mainly in Japan report "the first achievement in hetero-epitaxial growth of β-Ga2O3 thin films on single-crystalline diamond (111) wafers using RF magnetron sputtering". It is noted that growing Ga2O3 on high-thermal-conductivity single-crystal diamond (SCD) could enable devices with self-thermal management.

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SEMI BLOG

ADOPTING ATOMIC LAYER DEPOSITION – INSIGHTS FROM BENEQ, IMEC AND YOLE INTELLIGENCE

Atomic Layer Deposition (ALD) enables the scaling of logic and memory semiconductor devices and is currently experiencing rapid adoption in specialty device fabrication. SEMI spoke with Taguhi Yeghoyan, Senior Technology and Market Analyst, Semiconductor Manufacturing and Equipment at Yole Intelligence; Alexander Perros, Head of Process Development, Semiconductor ALD of Beneq; and Niels Posthuma, Principal Engineer, GaN Power Electronics at imec. The three industry experts shared their views on ALD's applicability in rising specialty device markets ahead of their talks at SEMICON Europa 2023.

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SEMI NEWS HIGHLIGHT

SEMI LAUNCHES INDUSTRY 4.0 READINESS ASSESSMENT MODEL TO ADVANCE SEMICONDUCTOR SMART MANUFACTURING MATURITY

SEMI announced availability of the new Industry 4.0 Readiness Assessment Model (IRAM) to help organizations across the semiconductor supply chain assess and track their smart manufacturing technology deployment progress and develop a roadmap for their digital transformations. Created through a collaboration of the SEMI Smart Manufacturing Initiative and industry experts, IRAM aids companies in identifying technology enhancements critical to scaling and sustaining their Industry 4.0 transformation to improve chipmaking efficiency, productivity, and quality.

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EVENTS



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