



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

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SAMSUNG SECURES \$6.4B TO EXPAND CHIP PRODUCTION IN TEXAS

Samsung will receive \$6.4 billion in direct funding under the CHIPS and Science Act to expand its presence in Texas. An expansion of the existing site in Austin would help in the production of Fully Depleted Silicon on Insulator (**FD-SOI**) process hardware, used in industries such as automotive.

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STMICROELECTRONICS SYNCHRONOUS RECTIFIER ENHANCES EFFICIENCY OF SILICON OR GAN CONVERTERS

The features of this controller enable converters to provide a high output power rating within compact dimensions. The controller is fabricated in ST's silicon-on-insulator (**SOI**) process, which ensures robust performance while permitting a tiny 2-by-2mm DFN-6L package.

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A LOW POWER INJECTION-LOCKED CDR USING 28 NM FDSOI TECHNOLOGY FOR BURST-MODE APPLICATIONS

A low-power Injection-Locked Clock and Data Recovery using a 28 nm Ultra-Thin Body and Box-Fully Depleted Silicon on Insulator (UTBB-FDSOI) technology is presented in this paper. The main novelty consists of the implementation of a complementary QRO based on back-gate control using **FDSOI** technology to realize a simple and efficient ILCDR circuit.

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THERMAL BOUNDARY CONDUCTANCE OF DIRECT BONDED ALUMINUM NITRIDE TO SILICON INTERFACES

In this work, researchers studied a direct bonded AlN-to-**SOI** wafer by measuring the thermal conductivity of AlN and the thermal boundary conductance of silicon (Si)/AlN and Si/SiO₂/aluminum–oxygen–nitrogen (AlON)/AlN interfaces. The results show that AlN-SOI is a very promising structure for improving heat dissipation in future microelectronics.

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SOI ECOSYSTEM NEWS

INFINEON AND AMKOR DEEPEN PARTNERSHIP AND STRENGTHEN EUROPEAN SUPPLY CHAIN FOR SEMICONDUCTOR SOLUTIONS

Both companies have agreed on operating a dedicated packaging and test center at Amkor's manufacturing site in Porto. Operations are expected to commence in the first half of 2025. The cooperation further strengthens the European semiconductor supply chain and contributes to making it more resilient – especially for automotive customers.

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WOLFSPEED SELECTS AIXTRON TOOLS TO SUPPORT 200MM PRODUCTION

AIXTRON announced Wolfspeed has placed multiple-tool orders in Q3 and Q4 2023 to utilize AIXTRON's G10-SiC to help further ramp production for 200mm (8-inch) silicon carbide (SiC) epitaxial wafers. "Wolfspeed has chosen our G10-SiC as part of their epitaxy solution plan for Durham and The JP, which will be the world's largest 200mm SiC materials factory", notes Aixtron's CEO & president Dr Felix Grawert.

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SILICON PHOTONIC NEUROMORPHIC ACCELERATOR USING INTEGRATED COHERENT TRANSMIT-RECEIVE OPTICAL SUB-ASSEMBLIES

This work proposes a scalable architecture based on a silicon photonic integrated circuit and optical frequency combs to offer high computing speed and power efficiency. A proof-of-concept silicon photonics neuromorphic accelerator based on integrated coherent transmit–receive optical sub-assemblies is experimentally demonstrated.

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LITHIUM NIOBATE ELECTRO-OPTIC MODULATION DEVICE WITHOUT AN OVERLAY LAYER BASED ON BOUND STATES IN THE CONTINUUM

Bound states in the continuum (BICs) are a unique optical resonance effect, ideally characterized by the absence of leaky modes. By leveraging the advantages of BICs, researchers have designed a traveling-wave electrode electro-optic modulator device based on an organic polymer + lithium-niobate-on-insulator (LNOI) substrate.

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COMPOUND SEMICONDUCTOR

SK SILTRON RECEIVES FURTHER SUPPORT FROM U.S. GOVERNMENT TO INVEST IN SiC WAFER

It is reported that SK siltron, which is building a silicon carbide (SiC) wafer plant for next-generation power semiconductors in Michigan, U.S., will receive a subsidy worth \$77 million from the state government. The additional support from the state comes just two months after the company received \$544 million in loans from the U.S. government.

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EUROPE APPROVES A PROJECT FOR AN ADVANCED CHIP PILOT LINE IN CATANIA, ITALY

The facility to be built in Catania, Italy, will be a highly innovative pilot line devoted to the research and development of new wide bandgap (WBG) materials like silicon carbide (SiC) and gallium nitride (GaN), key semiconductors for the high-growth Automotive, Industrial, and renewable energy markets.

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UV PHOTONIC INTEGRATED CHIP BASED ON EPITAXIAL III-N ON SI FOR SHORT-RANGE ON-CHIP DATA TRANSMISSION

Researchers has reported on progress toward ultraviolet photonic integrated circuits using III–nitride epitaxial layers on silicon substrates. The epitaxial layers of indium gallium nitride (InGaN) and aluminium gallium nitride (AlGaN) were applied by metal-organic chemical vapor deposition in a sequence typical for laser diode fabrication with waveguide and cladding layers.

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HIGHLY BIOMIMETIC SPIKING NEURON USING SiGe HETEROJUNCTION BIPOLAR TRANSISTORS FOR ENERGY-EFFICIENT NEUROMORPHIC SYSTEMS

Spiking neurons with highly compact and energy efficiency are crucial to implement spiking neural networks in hardware. This study proposed a novel spiking neuron using silicon–germanium (SiGe) based heterojunction bipolar transistors for low energy applications and implementation of biomimetic functions.

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SEMI BLOG

IMPROVING CHIP DESIGN AND VERIFICATION EFFICIENCY WITH IC MANAGE

ESD Alliance member company IC Manage is noted for enabling global teams to efficiently collaborate during design and verification of systems and chips. Robert (Bob) Smith, Executive Director of the ESD Alliance, recently talk to Shiv Sikand, founder and EVP of IC Manage, about challenges facing semiconductors design groups managing the flow of data.

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SEMI NEWS HIGHLIGHT

GLOBAL SEMICONDUCTOR EQUIPMENT BILLINGS SLIP TO \$106.3 BILLION IN 2023, SEMI REPORTS

Worldwide sales of semiconductor manufacturing equipment edged down 1.3% to \$106.3 billion in 2023 from an all-time record of \$107.6 billion in 2022, SEMI reported. The data is now available in the Worldwide Semiconductor Equipment Market Statistics (WWSSEMS) report.

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