



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

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SPECIAL ANNOUNCEMENT

The RF Workshop 2025, sponsored by Incize, is set for April 4 in Brussels. Leading experts from across the RF value chain—substrate manufacturers, foundries, fabless companies, IDMs, research centers, and academia—will come together for a full day of cutting-edge insights, in-depth discussions, and high-level networking.

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FEATURED IN THIS EDITION

ACCURATELY EXTRACTING SILICON WAVEGUIDE DIMENSIONS FROM A SINGLE HIGH-ORDER MACH-ZEHNDER INTERFEROMETER

This study demonstrates a new methodology for the extraction of dimensions from silicon-on-insulator (SOI) strip waveguides manufactured in IMEC's iSiPP50G silicon photonics platform. An innovative mapping model is introduced, which effectively relates the geometric dimensions of the SOI waveguide to its effective index and group index.

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COMPACT AND POWER-EFFICIENT 3 × 3 SILICON PHOTONIC INTERFEROMETER THERMO-OPTIC SWITCH

A thermo-optic 3 × 3 interferometer switch is proposed and demonstrated experimentally on silicon photonic platform. The device was fabricated on SOI wafer with a 220-nm-thick top-silicon layer and a 3-μm-thick buried-oxide (BOX) layer by using standard 180-nm CMOS foundry processes.

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ULTRA-COMPACT MULTIMODE WAVEGUIDE BENDS WITH ARBITRARY BENDING ANGLES

This study proposes for the first time ultra-compact multimode waveguide bends (MWBs) with arbitrary bending angles. The proposed MWBs are fabricated on a commercial SOI wafer with a 220-nm-thick top silicon layer and a 3-μm-thick silicon dioxide buried layer at Advanced Micro Foundry.

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INDIE SEMICONDUCTOR AND GLOBALFOUNDRIES ANNOUNCE STRATEGIC COLLABORATION

The design innovation and functional integration of analog, digital, RF, power management and memory functions in indie's radar solutions are enabled by GF's automotive-qualified 22nm fully depleted silicon-on-insulator (SOI) process technology.

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SOI ECOSYSTEM NEWS

ASML AND IMEC SIGN STRATEGIC PARTNERSHIP AGREEMENT

The collaboration incorporates ASML's whole product portfolio, with a focus on developing high-end nodes. Focus areas for R&D will also include silicon photonics, memory and advanced packaging, offering full stack innovation for future semiconductor-based AI applications in diverse markets.

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DC RELIABILITY OF HIGH-K GAN-ON-SI MOS-HEMTs FOR MM-WAVE POWER AMPLIFIERS

imec researchers present the main findings of one of the first reliability studies of GaN-on-Si for power amplifiers. In particular, they show charge trapping and emission in the HEMT-structures with high-κ dielectrics, and succeed to isolate the physical and energetic location of the responsible defects.

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INTEGRATED LOW-LOSS, HIGH-ISOLATION, AND BROADBAND MAGNETO-OPTICAL ISOLATOR WITH TE-MODE INPUT

This study provides an optimized design for TE-mode isolators based on the AlGaAs-on-insulator platform, offering low loss, high isolation, wide bandwidth, and good manufacturing tolerance adaptability. These advantages make the proposed device well suited for nonlinear optical platforms, particularly in efficient and stable integrated photonic systems.

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EFFECT OF DYNAMIC FLEXURAL STRENGTH ON IMPACT RESPONSE ANALYSIS OF ALN SUBSTRATES FOR AEROSPACE APPLICATIONS

Based on the dynamic flexural-strength testing results, this study achieves the prediction of low-speed impact response for aluminum nitride (AlN) ceramic structures, providing technical support for the impact reliability analysis of aerospace ceramic-packaging devices.

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COMPOUND SEMICONDUCTOR

THE GROWTH OF WIDE BANDGAP POWER DEVICES

Supported by subsidies and motivated by cutting carbon footprints, more and more drivers are switching to electric vehicles. It's a move that has implications that include helping to drive up revenue for wide bandgap technologies, today the combination of SiC and GaN.

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GAN-IGBT COMBO TARGETS EV POWERTRAINS OVER 100KW

Cambridge GaN Devices (CGD) has revealed more details about a solution that will enable the company to address EV powertrain applications over 100kW. The combo combines smart ICeGaN HEMT ICs and IGBTs in the same module or IPM, maximising efficiency and offering a cost-effective alternative to expensive SiC solutions.

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IMPROVEMENT OF GAN-BASED DEVICE PERFORMANCE BY PECVD DIRECTLY PREPARING h-BN WITH EXCELLENT THERMAL MANAGEMENT CHARACTERISTICS

The direct preparation of two-dimensional materials on gallium nitride is rather challenging. In this study, high-quality h-BN was prepared directly on GaN films using plasma-enhanced chemical vapor deposition, which revealed that the introduction of appropriately sized active sites is key to the growth of h-BN.

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DIELECTRIC PASSIVATION TREATMENT OF INGAN MESA ON SI SUBSTRATES FOR RED MICRO-LED APPLICATION

The findings demonstrate the efficacy of metal-oxide dielectric passivation in addressing critical challenges in InGaN red micro-LED on silicon substrate fabrication, contributing to accelerating scalable and efficient next-generation display technologies.

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SEMI BLOG

DRIVING SEMICONDUCTOR CAREER OPPORTUNITIES IN THE MIDWEST

The inaugural SEMIEXPO Heartland scheduled for April 1-2, 2025 in Indianapolis, Indiana, with a focus on Smart Mobility and Smart Manufacturing, provides an opportunity for industry collaboration and growth. Students, recent graduates, military veterans and professionals returning to work after an absence will discover how microelectronics enable a smart future that is radically changing everyday life.

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SEMI NEWS HIGHLIGHT

SEMI EUROPE RECOGNIZES NXP AND OKMETIC LEADERS FOR THEIR IMPACT ON THE SEMICONDUCTOR INDUSTRY

SEMI Europe announced the winners of the SEMI European Award and Special Service Award for 2024 at the SEMI Industry Strategy Symposium Europe (ISS Europe) 2025. Kurt Sievers, President and CEO of NXP Semiconductors, was honored with the SEMI European Award and Anna-Riikka Vuorikari-Antikainen, Chief Commercial Officer of Okmetic, received the Special Service Award.

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