



ICNS 15 in Sweden



ICNS 15
Malmö, Sweden 2025

We organize the most significant event in the field of Nitride Semiconductors – the international conference on nitride semiconductors. ICNS 15 will be held on July 6 - 11, 2025 in Malmö, Sweden. We invite you to save the date for this exciting event and sign up for updates!
www.icns15.com

C3NiT day 2023

C3NiT Day 2023 was hosted at Lund University on 23rd November 2023. Speakers were Edward Chang, National Yang Ming Chiao Tung University, Taiwan (invited), Riccardo Negri (Volvo), Roger Nilsson (Veeco) and project leaders. Students gave poster pitches as an overview of their work and a good opening for the discussions in the poster session.

LATEST PUBLICATIONS

D.-Y. Chen, et al., "Impact of the Channel Thickness on Electron Confinement in MOCVD-Grown High Breakdown Buffer-Free AlGa_xN/GaN Heterostructures", Phys. stat. sol. (a) **220** (16), 2200496 (2023). [link](#)

S. Knight, et al., "Room temperature two-dimensional electron gas scattering time, effective mass, and mobility parameters in Al_xGa_{1-x}N/GaN heterostructures (0.07 ≤ x ≤ 0.42)", J. Appl. Phys. **134** (18), 185701 (2023). [link](#)

B. Hult, et al., "Investigation of Isolation Approaches and the Stoichiometry of SiNx Passivation Layers in "Buffer-Free" AlGa_xN/GaN Metal-Insulator-Semiconductor High-Electron-Mobility Transistors", Phys. stat. sol. (a) **220** (16), 2200533 (2023). [link](#)

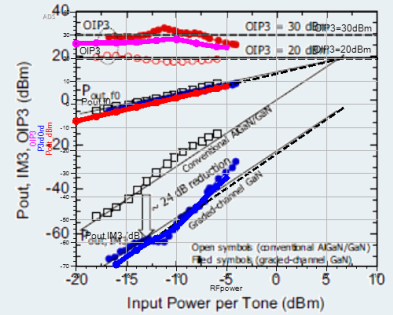
A. M. Vidarsson, et al., "Observations of very fast electron traps at SiC/high-κ dielectric interfaces", APL Materials **11** (11), 111121 (2023). [link](#)

PROJECT UPDATES

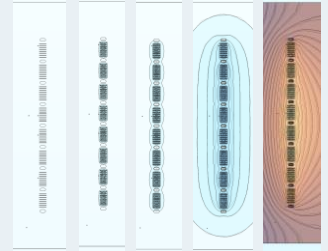


Linear E/W band HEMTs and MMICs

Collaboration with University of Bristol on epitaxial optimization by using TCAD and compact models in microwave CAD software. Excellent prediction of relevant FOM for linear HEMTs. Based on these results, a new epitaxial design is realized at LiU, and HEMT processing will follow at Chalmers.



The thermal transient behavior of GaN HEMTs is studied using an integrated sensor placed in the close vicinity of a heat source. We show how lateral separation, dissipated power, and proximity to the edge of the chip impact the temperature increase of a device. It is concluded that the method is promising for calibrating numerical models and evaluating packaging solutions.



High voltage HEMTs and circuits for power and microwave applications

The first high voltage (200 V) microwave (S-band) GaN HEMTs designs are finalized with processing ongoing. Nitrogen implantation developed for very high isolation with BV = 3 kV at 25μm for SweGaN's QuanFine structures.



Advanced epitaxial concepts for cost reduction

An epitaxial process of fully coalesced thin GaN on AlN substrates was established. Next steps include growth of double heterostructure HEMT and evaluation of 2DEG properties and breakdown voltage.

Award

Congratulations to Ragnar Ferrand-Drake Del Castillo from Chalmers University for Best Student Award at ICNS 14 in Fukuoka, Japan. Ragnar has investigated carbon doping levels in the back barrier and buffer layer of III-nitride HEMTs and their impact on the device performance.



Next Board Meeting February 27th 2024 via Teams