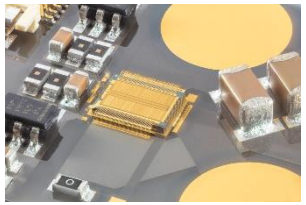
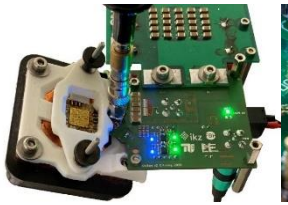
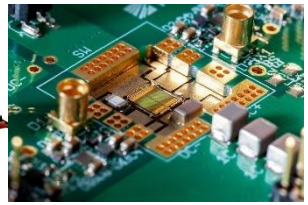
DFG Priority Programme 2312

GaNius - Energy Efficient Power Electronics

Status meeting GaNius I and Kick-off meeting GaNius II 2024
19.09.-20.09.2024 – Berlin

Meeting location
Hauptgebäude Technische Universität Berlin
Straße des 17. Juni 135
10623 Berlin
Room H 0111

Nearby accommodation (Examples)

- AZIMUT Hotel Kurfürstendamm Berlin
- aletto Hotel Kudamm
- Novum Hotel Gates Berlin Charlottenburg

Scope of project presentations

- Achievements
- Current and remaining challenges
- Further steps, ideas to solve challenges, basics for discussions

Contact

- benedikt.kohlhepp@tu-berlin.de, +49 (0)30 314 77723
- sibylle.dieckerhoff@tu-berlin.de, +49 (0)30 314 25511

Programme, 19.09.2024

GaNius I project status meeting:

9:00-9:30	**Welcome**, *S. Dieckerhoff (TU Berlin)*
15 min	**Electronic transport of polarization-induced, two-dimensional electron gases with extremely high sheet carrier density for ScAlN/GaN-based power devices (ScNius)**, P. Fischer, J. Heitmann (*TU Freiberg*), Y. Ali, O. Ambacher (*TU Freiburg*)
15 min	**Planar and Vertical Junctions for innovative GaN-Based High-Power Devices**, *Q. Shu, A. Vescan (RWTH Aachen), K. Wein, J. Christen (OvGU Magdeburg)*
15 min	**Transition metal-nitride-AlGaN layers for electronic applications by sputtering epitaxy**, C. Lüttich, A. Dagdar, *J. Grümbel, M. Feneberg (OvGU Magdeburg)*
15 min	**Aluminum Nitride for vertical Power Electronics**, R. Miranti-Augustin, A. Waag *(TU Braunschweig), S. Faber, B. Witzigmann (FAU Erlangen-Nuremberg)*
15 min	**Monolithically Integrated Bidirectional GaN-Based Switch enabling Self-Healing Multi-Winding DC/DC Converters**, A. Vescan *(RWTH Aachen), R. Barzegarkhoo, M. Liserre (CAU Kiel)*
15 min	**Conformal 3D Ceramic-Based Intelligent GaN Power Systems-in-Package (3D-CeraGaN),** *M. Rueß, I. Kallfass, P. Mack, A. Zimmermann (U Stuttgart)*
11:00-11:30	**Coffee break**
15 min	**Modelling and characterization of GaN-HEMT devices with respect to effects of charge carrier trapping,** *P. Swoboda, M. Sack I. Vorotiahin, M. Hiller (KIT)*
10 min	**Modelling and Assessment of Threshold Voltage Instabilities in p-gate GaN HEMTs**, *M. Pfost (TU Dortmund)*
20 min	**High Frequency Switching Power Converters based on AlN-based Power Transistors**, *J. Schlindwein, S. Dieckerhoff (TU Berlin), H. Halhoul, O. Hilt, A. Wentzel (FBH)*
15 min	**Adaptive GaN gate driver with inductive feed-forward for highest efficiency (AGaNDrive),** *C. Lawniczak,* M. Pfost *(TU Dortmund), K. Smilowski, R. Kokozinski (U Duisburg-Essen)*
10 min	**GaN-Enabled Three-Phase PFC-Rectifier Family in CCM-Boost Mode Employing Only Two HF-Switches and Inductors for Low Common Mode and Simplified Power Architectures**, F. *Schafmeister (U Paderborn)*
12:40-13:40	**Lunch break (Mensa TU Hardenbergstraße)**
13:40-15:00	**Poster Session / Cluster Meetings**
15:00-15:15	**Tea break**
15:15-15:45	**Summary by cluster spokespersons**
15:45-16:00	**Closing discussion**
	Hotel check-in
19:00-21:00	**Dinner Restaurant Latino**

Programme, 20.09.2024:

Kick-off of GaNius II:

9:00-9:15	**Welcome 2nd Day** *S. Dieckerhoff (TU Berlin)*
9:15-9:45	**Information for GaNius I and introduction to GaNius II**, *F. Neumann (DFG)*
5 min	**Determining the Temperature of GaN based power semiconductors based on Temperature Sensitive Paramaters (TSEP),** M. Bakran (*U Bayreuth*)
10 min	**ReToGaN – Investigations of Reliability, Parameter Stability and Topologies for GaN-Based Power Electronics,** *T. Basler (TU Chemnitz), J. Friebe (U Kassel)*
10 min	**Modelling and Characterization of GaN-HEMTs under Stress Conditions in Power Electronic Systems,** *S. Dieckerhoff (TU Berlin), M. Pfost (TU Dortmund)*
15 min	**High Frequency Switching Power Converters based on AlN-based Power Transistors,** *S. Dieckerhoff, (TU Berlin), O. Hilt, A. Wentzel (FBH)*
5 min	**Characterization and Application of GaN-HEMTs at Cryogenic Temperatures,** *M. Hiller (KIT)*
10:30-11:00	**Coffee break**
10 min	**GaN-HEMT Driver utilizing Alternative Control and Feed-Forward Techniques (GaNdalf),** *A. Grabmaier (U Duisburg-Essen), M. Pfost (TU Dortmund)*
10 min	**Highly-Efficient, Isolated Multi-MHz GaN-based DC-DC Converters with Active Diode Rectification,** *I. Kallfass (U Stuttgart), M. März (FAU Erlangen-Nuremberg)*
10 min	**Exploiting GaN Devices for Drive Inverters and Drive Inverters for GaN Devices (DriveForGaN),** *A. Lindemann (UVGU Magdeburg), R. Mallwitz (TU Braunschweig)*
5 min	**Performance Evaluation of Soft-and Hard-Switched Inverters Based on Monolithically-Integrated Bidirectional GaN Devices,** *M. Liserre (CAU Kiel)*
5 min	**Bidirectional-GaN-based Soft-switched Current Source Converters,** *M. Lobo-Heldwein (TU München)*
5 min	**Toward chip-scale Off-line Power supplies in GaN: Advancing monolithic GaN analog and mixed signal circuit design for high-efficiency and highly integrated power-factor correction (PFC) converters,** *B. Wicht (LU Hannover)*
11:45-12:30	**Set up of posters and poster session part I**
12:30-14:00	**Lunch break (Schleusenkrug)**
14:00-15:00	**Poster session part II, discussion of collaborations**
15:00-16:00	**GaNius network matters, collaboration within the network and closing**