



UltimateGaN- Research for GaN technologies, devices, packages and applications to address the challenges of the future GaN roadmap

The main objective of UltimateGaN is to safeguard Europe's leading position in terms of power semiconductors and high performance RF applications by driving an innovative breakthrough change with the next generation of GaN-technologies. Several predecessor projects are the basis for the availability of the first generation of European based GaN-devices, also revealing that the challenges of these technologies have been heavily underestimated. This makes the high potential of GaN clearly evident to overcome the persisting threats of higher electric fields, current densities and power densities related to the necessity of device shrinkage.

The new concept of following a vertical approach to address research through the entire supply chain of technology, packaging, reliability and application will enable a significant improvement of efficiency that goes beyond the limits of silicon based semiconductors in combination with packages that fully utilize the shrink-path of power GaN devices and which are not ready as of today.

UltimateGaN's unique approach addresses, among others, the following innovative applications with the scope to enable digitalisation and energy efficiency for 5G, Smart Grids and Smart Mobility that goes hand in hand with a significant reduction of the CO2 footprint:

- Extremely efficient server power supply enabling lower energy consumption in data centres
- Benchmark Photovoltaic inverters in terms of efficiency and size to foster the use of renewable energies
- Affordable 5G-Amplifiers up to mm-wave enabling a faster 5G rollout
- GaN powered LIDAR application to enable autonomous driving
- Highest efficiency μ -Grid-converters and On-Board Chargers

The global state-of-the-art first generation GaN devices are mainly based on US and Asian suppliers. Only a cooperative project like UltimateGaN with European market leaders and world-class researchers can take on the challenges and bring Europe at the forefront in terms of GaN enabled opportunities.

UNIPD Team Leader: Andrea Meneghini

Department: Department of Information Engineering

Coordinator: Infineon Technologies Austria AG (Austria)

Other Participants:

Fronius International GmbH (Austria)

Silicon Austria Labs GmbH (Austria)

Technische Universität Graz (Austria)

AT & S Austria Technologie & Systemtechnik Aktiengesellschaft (Austria)

Interuniversitair Micro-Electronica Centrum (Belgium)

Aixtron SE (Germany)

Infineon Technologies AG (Germany)

Siltronic AG (Germany)

Max-Planck-Institut für Eisenforschung GmbH (Germany)

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. (Germany)

Technische Universität Chemnitz (Germany)

NaMLab gGmbH (Germany)

Università degli Studi di Padova (Italy)

Infineon Technologies Italia S.r.l. (Italy)

Università degli Studi di Milano-Bicocca (Italy)

Eltek AS (Norway)

Slovenská technická univerzita v Bratislave (Slovakia)

Nano Design SRO (Slovakia)

École polytechnique fédérale de Lausanne (Switzerland)

Attolight SA (Switzerland)

Ikerlan S. Coop. (Spain)

For Optimal Renewable Energy Systems S.L. (Spain)

Lear Corporation Engineering Spain Sociedad Limitada (Spain)

RISE Research Institutes of Sweden AB (Sweden)

SweGaN AB (Sweden)

Total EU Contribution: Euro 14.093.529,07

Call ID: H2020-ECSEL-2018-2-RIA-two-stage-1

Project Duration in months: 36

Start Date: 01/05/2019

End Date: 30/04/2022

Find out more: <https://cordis.europa.eu/project/id/826392>