



Press Release

EU Research Project “UltimateGaN”: energy-saving chips made from new material as a turbo for renewable energy, e-mobility and CO₂ savings

Villach, 13 May 2019 – The European research project UltimateGaN (research for GaN technologies, devices and applications to address the challenges of the futureGaN roadmap) was launched today with Infineon Austria taking the lead role. Over the next three years, 26 partners from nine countries will conduct research on the next generation of energy-saving chips based on the new semiconductor material gallium nitride (GaN). The objective is to make these power semiconductors available for a wide variety of applications at globally competitive cost levels. This also means the project will make an important contribution to increasing energy efficiency and decreasing CO₂. Its volume of 48 million euros makes UltimateGaN one of the largest European research projects.

The worldwide demand for energy is increasing as ever more applications in daily life are being digitalized and electric vehicles are entering the mass market in greater numbers. Energy-saving chips made from new materials such as gallium nitride play a key role in converting electrical power much more efficiently than previously, which saves energy and minimizes the CO₂ footprint.

“Energy efficiency is one of the greatest energy resources worldwide. With the development of intelligent technologies, we are making a key contribution to dealing with the global challenge of climate change, and new materials and efficient chip solutions play a central role in this process. This research project will establish the prerequisites for making innovative energy-saving chips available for a wide range of future-oriented daily applications,” says Sabine Herlitschka, CEO of Infineon Technologies Austria AG. “We are joining forces both in terms of content and finances. This means we are bringing together the strategic expertise of the best European partners and strengthening our global competitiveness from bases in Carinthia and elsewhere in Austria and Europe.”

“Semiconductor products made from gallium nitride are revolutionizing the use of energy at many levels,” explains Andreas Urschitz, Head of the Power Management & Multimarket division at Infineon Technologies AG. “This research project taps into an enormous global market potential. It will enable higher performance and greater efficiency in a variety of applications and will also significantly improve user convenience. Faster charging of electric cars, data exchange between systems, objects and machines in real time, energy-saving

feeds of solar power into the grid and lightning-quick video streaming will become reality as a result.”

UltimateGaN – smaller, energy-efficient chips at marketable costs

The objective is to develop power and high-frequency electronics using the new semiconductor material GaN. As a competence center with global expertise in the new semiconductor materials silicon carbide and gallium nitride, Infineon Austria is contributing its existing know-how to the project. The prerequisites for the new project were created with the “PowerBase” research project in Villach completed in 2018. The project succeeded in setting up Europe’s first GaN pilot line in an industrial production environment and creating the foundational generation for initial market applications.

The research will now go one step further in terms of material and process technologies in order to establish the next generation of these highly efficient energy-saving chips for the mass market, with the focus on further miniaturization and producing the chips in high quality and at globally competitive cost levels. The unique material structure of GaN enables higher current densities to be achieved, which allows smaller and lighter designs that switch the current much more efficiently and can transmit higher data rates more quickly. The result is a significant reduction in energy consumption: current losses are reduced by up to 50%.

Forward-looking applications benefit: renewable energy, e-mobility and faster data transfer

Many applications in which low energy consumption, compact designs and faster data exchange are key will benefit from the use of these energy-saving chips. E-mobility and intelligent power grids will gain a further boost through the research project. For example, small, integrated “on-board” chargers with GaN chips will make charging electric cars three times faster than now – even at home. Thanks to these efficient power semiconductors, renewable energy sources such as solar or wind power can be integrated more easily and quickly into the power grid. The new 5G mobile communication standard and ultra-fast video loading are also supported, for example, as is real-time traffic flow control for autonomous driving or, in the context of Industry 4.0, easy communication between machines.

Research efforts focused along the entire value chain

When seeking to miniaturize of GaN chips, the small and compact design as well as the complex technology required for the connections and casings present special challenges. High current densities, the effect of electrical fields, and material stresses and stabilities must be taken into account. As a result, the research will take a holistic approach with the entire value chain in focus – from process development, design, assembly and packaging technologies to integrated

system solutions. The consortium of partners from academia and business is therefore equally broadly based.

Project kickoff with renowned participants from across Europe

With a volume of around 48 million euros, the project is one of the largest European GaN research efforts. It is being funded through investments from industry, grants from individual participating countries and the ECSEL Joint Undertaking (Electronic Components and Systems for European Leadership).

The kickoff event hosted by Infineon in Villach was attended by a number of distinguished project partners. The area of grant funding and the political arena were represented by **Olivier Lambinet** (Head of Administration, ECSEL Joint Undertaking), **Michael Wiesmüller** (Head of the Department for Information and Industrial Technologies and Aerospace at the Austrian Federal Ministry of Transport, Innovation and Technology) and **Peter Kaiser** (governor of Carinthia).

Europe united – 26 partners from nine countries researching together

Austria: Austria Technologie & Systemtechnik AG, Infineon Technologies Austria AG, Fronius International GmbH, CTR Carinthian Tech Research AG, Graz University of Technology | **Belgium:** IMEC | **Germany:** AIXTRON SE, Infineon Technologies AG, Siltronic AG, Max-Planck-Institut für Eisenforschung GmbH, Fraunhofer Society for the Promotion of Applied Research e.V., Chemnitz University of Technology, NaMLab GmbH | **Italy:** Università degli studi di Padova, Infineon Technologies Italia, Università di Milano Bicocca | **Norway:** Eltek AS | **Slovakia:** Slovak University of Technology in Bratislava, Nano Design SRO | **Switzerland:** Ecole Polytechnique Fédérale de Lausanne EPFL, Attolight SA | **Spain:** IKERLAN, For Optimal Renewable Energy, LEAR | **Sweden:** RISE Research Institutes of Sweden AB, SweGaN AB

About Infineon Austria

Infineon Technologies Austria AG is a subsidiary of Infineon Technologies AG, a world-leading provider of semiconductor solutions that make life easier, safer and greener. Microelectronics from Infineon reduce the energy consumption of consumer electronics, domestic appliances and industrial facilities. They make a major contribution to the convenience, safety and sustainability of vehicles, and enable secure transactions in the Internet of Things.

Apart from Germany, Infineon Austria is the only subsidiary that pools competencies for research and development, production and global business responsibility. The head office is in Villach, with further branches in Graz, Klagenfurt, Linz and Vienna. With 4,201 employees from around 60 countries (including 1,813 in research and development), the company achieved a turnover

of 2.9 billion euros in the 2018 fiscal year (ending September 30th). With research expenditures of 498 million euros, Infineon Austria is one of the strongest research performers among Austrian businesses.

More information is available at www.infineon.com/austria

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