



# gan-on-Silicon Efficient mm-wave euROpean systEm iNtegration pLatform

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### Consortium

9 partners (5 countries)

### Project Coordinator

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Project number: **779305**

Project website: [www.serena-h2020.eu](http://www.serena-h2020.eu)

Project start: **1<sup>st</sup> January, 2018**

Duration: **36 months**

Total cost: **EUR 3,910,185**

EC contribution: **EUR 3,910,185**

## Main Project Information and Project Goals

### SERENA aims to

- extend the limits of mainstream semiconductor technologies by developing a low-cost and high-performance (high-power and high-efficiency) hybrid integration platform for mm-wave systems,
- develop a GaN-on-Silicon cost- and power efficient mm-wave 5G beam-steering system as a proof-of-concept for future key markets (mm-wave 5G wireless communication systems and radars for autonomous vehicles).

### SERENA Goals

High-power and high-efficiency is enabled by advanced GaN-on-Si technology offering unprecedented efficiency and output power 10 times more than SiGe/CMOS.

Compared with the state-of-the-art the SERENA architecture and platform will bring the following system level advancements:

- increased energy efficiency
- size & cost reduction
- significant reduction in design time/complexity
- increased transmitter output power
- reduction of power consumption
- increased wireless area capacity (bit/s/km<sup>2</sup>)





## Message from the Coordinator

*The intention of this newsletter is to open a new communication channel in order to provide news on the project progress and to discuss ongoing topics relevant to SERENA for internal and external project partners, stakeholders and all other interested bodies.*

For more detailed information about and around the project we warmly invite you to have a regular look on our project website, which is kept up-to-date with the latest project related news. [www.serena-h2020.eu](http://www.serena-h2020.eu)

The project has successfully started with the kick-off meeting in January 2018 and since then the project has been in its initial stages of formation.

## Workshop at Fraunhofer IZM

22<sup>nd</sup> - 23<sup>rd</sup> February 2018 @ Berlin, Germany



Participants of the H2020 project SERENA met in February 2018 to attend a workshop on the integration platform for a novel RF front-end module for 5G mmWave applications.

13 attendants from CHALMERS, Fraunhofer, IFAT, OMMIC and TUB discussed the design of the integrated front-end module to be developed in low-cost PCB-based chip embedding technology. Topics included the

module requirements from the application perspective, system concept, specifications of the active and passive components, antenna configuration as well as characteristics of the embedding technology. Based on this information, a concept and draft

physical design of the embedding module were developed including information on the selection of materials, substrate stack-up and the partitioning of the components.

The discussion highlighted the multidisciplinary challenge of the integrated front-end module taking into account RF, manufacturing, thermal, thermo-mechanical size and cost aspects.

## Kick-off meeting at IFAT

15<sup>th</sup> - 16<sup>th</sup> January 2018 @ Villach, Austria

On the 15<sup>th</sup> and 16<sup>th</sup> January 2018 the SERENA consortium met for the Kick-off meeting hosted by Infineon Austria AG in Villach.

The first day was dedicated to get to know each other and to organize the further collaboration of the project partners.

Technical work packages were shortly introduced and WP1 "System architecture and

specifications" officially kicked-off. Furthermore, a brief overview about organizational

issues, reporting and financial management has been given.

The second day focused on the official kick-off of the remaining work packages and first technical alignment discussions.

Certain tasks and responsibilities were defined and partners agreed on the next steps in the project.





## Technical Approach

To reach SERENA's goals a system architecture and technology platform by using an integrated approach will be developed, advancements in hybrid ana-

logue/digital mm-wave-beam steering system architectures with a completely European based semiconductor supply chain will be combined, and the project team will

foster an inter-disciplinary design approach with a strong emphasis on multi-physics simulations and predictive co-design to show the unique capabilities of the project.

### Submitted public deliverables

- **D7.1** Internal and external IT communication infrastructure and project website
- **D8.1** Project quality plan

### Scientific Publications

An Analog Module for Hybrid Massive MIMO Testbeds Demonstrating Beam Alignment Algorithms (Thomas Kühne, Giuseppe Caire, International ITG Workshop on Smart Antennas WSA2018, Bochum Germany March 2018)

## Ongoing Activities

After the successful project kick-off each partner has enthusiastically looked into their tasks within the particular WPs and started progress towards the objectives. The first deliverables have been submitted and quite some work has been performed during the last 4 months.

The work in WP1 in collaboration with WP5 (and also WP2 and WP3) has been swiftly started. This interconnection between the work packages is very positive from the project perspective view.

Conference calls and face-to-face meetings have been conducted to exchange on the progress of work and to discuss technical details. Most importantly, there exists already an early draft for D1.1.

Further, a project website and information platform has been set up, a project logo, leaflet, an announcement letter and press releases have been created. Additionally, a [Twitter](#) and [LinkedIn](#) account were established.

## Upcoming Conferences and Meetings

### ICC - 20<sup>th</sup> to 24<sup>th</sup> May 2018

@ Kansas City (MO) USA

### ISCAS - 27<sup>th</sup> to 30<sup>th</sup> May 2018

@ Florence Italy

### Compound Semiconductors Week - 29<sup>th</sup> of May to 1<sup>st</sup> of June 2018

@ Boston (MA) USA

### SERENA Technical Meeting - 4<sup>th</sup> to 5<sup>th</sup> June 2018

@ Göteborg Sweden

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