SNS JU FEM 2026 Call for Proposals

Info Day & Brokerage Event

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SNS JU **FRONT END MODULE (FEM) CALL**

Long Term Vision

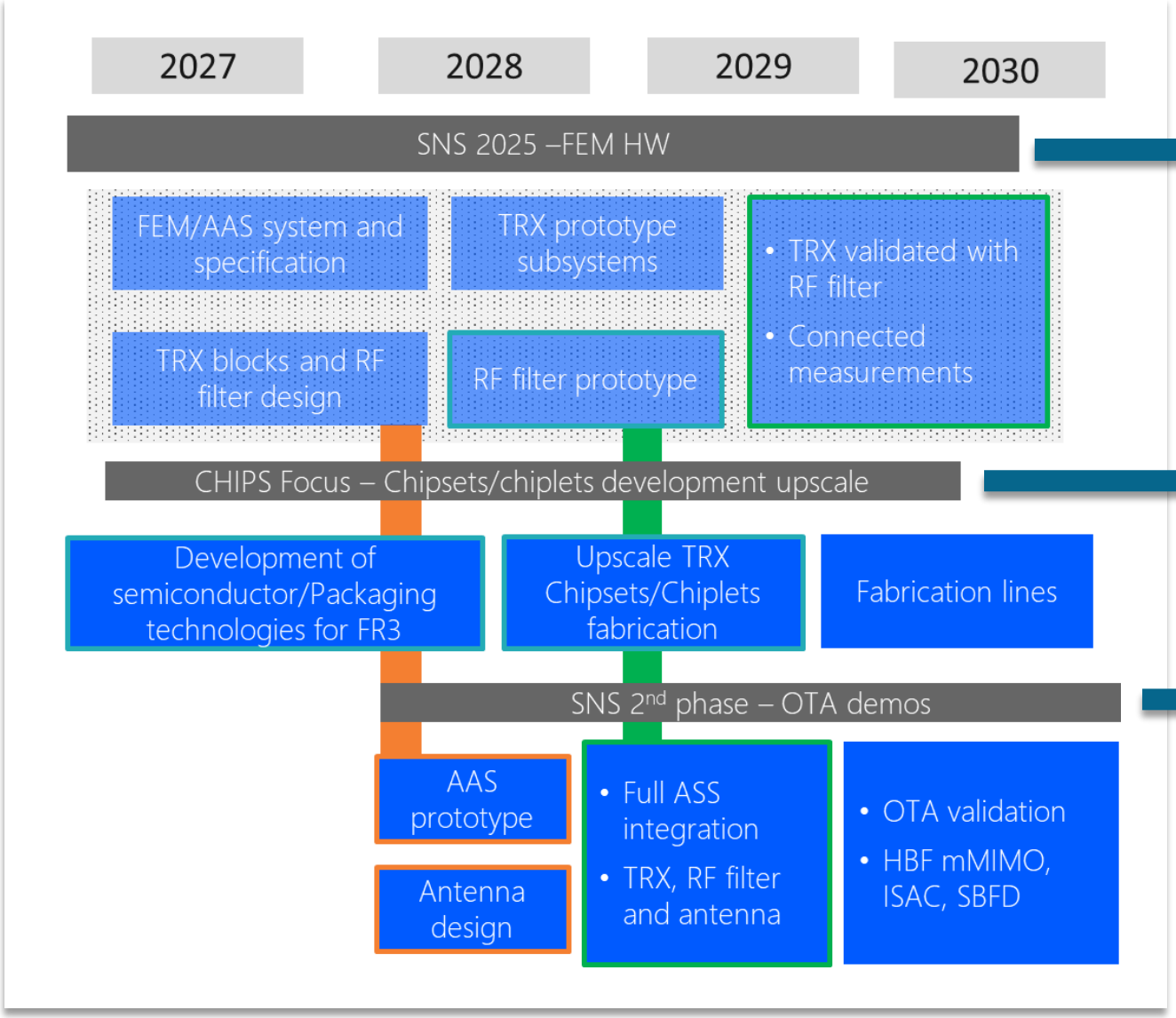
- **NOT** Business as Usual
- **Large-scale** initiative spanning over several calls across 2 JU's;
  1. **SNS JU FEM call**: System and design perspective
  2. **Chips JU call under WP 2026**: Detailed technological perspective
  3. **Last call under SNS WP 2027** (TBD/TBC): Integration and testing perspective

Key Success Factors

- **Complementarity and directionality** over the various calls
- **Strong European industry commitment** (telecom+µElectronics)
- **Industrialization target**: EU capabilities in µElec for telecoms (Chips Act)

European Sovereignty and competitiveness

Complementarities



FEM Journey approach

- **SNS phase 1** System aspects, tech trade offs, critical subsystem PoC's
- **Chips'26** detailed tech design, **upscale of chips development and integration** technologies to achieve industry grade FEM and **facilitate the evolution towards full integration/OTA validation**.
- **SNS phase 2 (TBC)** Integration, OTA testing

Multifaceted Challenges underpinning FEM Work

FR3 Band & Upper 6GHz band

- Usability of **FR3 band**, (7–15 GHz range) in Europe and the **upper 6 GHz band** (6.425–7.125 GHz) following latest RSPG recommendations and WRC 27 Agenda Items
- **Sharing** capabilities wth incumbent services
- **Versatile implementations** across different ITU regions.

Technological Issues

- **Complexity of RF Front end,** high integration level of antennas
- **Processing complexity**
- **SiP, integration** of multiple technologies from baseband to RF, **packaging**
- **AI/ML applicability** for key L1 functions.
- **µElec tech trade offs**
- **Cost, energy efficiency**

Use Case aspects

- Latest progress at 3GPP on technology and **use case characteristics**: reuse of cell sites, Sub Band Full Duplex, ISAC integration, 400 MHz channels, uplink emphasis..
- **Wideband digitization**, fast and accurate channel-select filtering , HBF for TDD systems
- AI/ML **high uplink capacity** requirements

Industrial Issues

- Stimulating **European know-how** in microelectronics components and systems for coms (Chips Act)
- Stimulating a **European supply chain** in the domain of microelectronics for telecom and networked services platforms (FEM design, integration and packaging)
- **Leveraging Chips JU Pilot lines** towards pre industrialization and exploitation

Scope of the SNS JU Call (1/3)

Scope

Complete FEM **design and architecture**, from Digital to RF modules

- **Coverage of the FR3 band with upper 6GHz**, sharing compatibility as appropriate, ITU regional variations capable;
- **ISAC capabilities**, maximisation of functional blocks;
- **Characterisation of all building blocks**, PA, LNB, BF, etc.
- **Integrated design from RF to Baseband**, taking into account ITU requirements (BW, channel width, etc.)
- **Capability for high uplink capacity** (AI/ML traffic);

Scope of the SNS JU Call (2/3)

Scope

Complete FEM **design and architecture**, from Digital to RF modules

- **Coverage of use case requirements**: FWA/cellular capability, Sub Band Full Duplex operations, secure ISAC integration.
- **Analysis and trade off technologies**: FDSOI, GaN, InP, CMOS…and their integration, also considering i) EU ecosystem capabilities; ii) Chips JU PL transfer; iii) packaging feasibility.
- **AI/ML applicability for key L1 functions**, e.g., CSI, spectrum management and I/F mitigation, non-functional properties such as energy efficiency. (indicative list).
- **AI/ML implementation aspects not suggested**.
- **Plan for transfer towards Pilot lines** and assessment of design tools/environment (EDA, PDK).

Scope of the SNS JU Call (3/3)

Scope

Other relevant aspects

- **PoC (s) for critical subsystems** in scope at TRL 4/5
- **Key 1**: Very solid **combination of European industrial leaders** in the radio coms and microelectronic domains, with a demonstrated track record and **capabilities to industrialize** and market the solution in Europe and at a global level
- **Key 2:** Contribution to the **sovereignty of the EU supply chain** in the domain of microelectronics for telecom/networked services platforms. It implies control of FEM design, implementation, and packaging with European solutions up to the prototyping level, without backdoor implementation via firmware, and full security of the final solution.

NB: Applicants should clearly identify the priorities addressed if they only cover a subset of the above scope

Expected Outcomes (1/2)

FEM DESIGN — TECHNICAL CAPABILITIES

SPECTRUM COVERAGE

FR3 (7–15 GHz, ext. to 24 GHz) + Higher 6 GHz band.
Built-in tuning for regional variations (WRC-27).

INTERFERENCE MITIGATION & SHARING

Protects incumbent FR3 users; maximises spectrum sharing aligned with the European regulatory approach.

MASSIVE MIMO & ANTENNA INTEGRATION

Supports a large number of antenna elements beyond SoA. Compensates increased path loss through massive MIMO.

RF PROCESSING CAPACITY

At least an order-of-magnitude increase in RF processing vs 5G FR1 implementations.

5G SITE REUSE & DEPLOYMENT SIMPLICITY

Enables reuse of existing 5G cell sites, minimising deployment complexity and rollout cost.

SUB BAND FULL DUPLEX (SBFD)

Concurrent, efficient SBFD implementation with minimised waveform differences and maximised common functional blocks.

INTEGRATED SENSING & COMMUNICATIONS (ISAC)

Simultaneous ISAC support with common waveform design; sensing and communication functions share maximum functional blocks.

UPLINK CAPACITY FOR NEW USE CASES

Addresses 6G requirements for greater uplink capacity serving new traffic classes and emerging use-case scenarios.

ITU IMT-2030 COMPLIANCE

Meets ITU IMT-2030 requirements: increased carrier rate, user data rate and reduced latency targets.

CELLULAR & FWA DUAL-MODE SUPPORT

Enables both cellular (FR1-like) and Fixed Wireless Access (FR2-like) deployment scenarios on a single platform.

Expected Outcomes (2/2)

INDUSTRIAL AND STRATEGIC

EUROPEAN TELECOM–MICROELECTRONICS ECOSYSTEM

Strong and lasting cooperation between European lead telecom system suppliers and microelectronics technology leaders. Stimulates a European telecom components ecosystem aligned with EU sovereignty objectives.

MICROELECTRONICS HETEROGENEOUS INTEGRATION

Low-cost, low-energy elementary constituent modules. Efficient packaging leveraging heterogeneous integration technologies where European industry holds strong expertise and know-how.

ADVANCED DESIGN TOOLS (EDA / PDK)

Stimulates availability of higher-TRL design tools including EDA platforms and PDKs (Process Design Kits), enabling a more competitive European semiconductor design capability.

INDUSTRIALISATION PATHWAY & CHIPS JU PILOT LINES

Clear roadmap toward downstream industrialisation in Europe. Leverages Chips JU pilot lines based on technology selection, creating a direct bridge between research and manufacturing.

CHIPS JU ECOSYSTEM BRIDGE

Coordinated pathway to Chips JU calls. Technology readiness trajectory designed to feed into European semiconductor manufacturing infrastructure and supply chain resilience.

APPLY AI STRATEGY — EU POLICY ALIGNMENT

Contributes to the Union's Apply AI Strategy. Positions 6G FEM research as an enabler of AI-integrated networks, aligning with EU digital sovereignty and industrial competitiveness goals.

FEM Design outcomes directly **support EU technological sovereignty** in 6G infrastructure
Connecting advanced RF engineering, microelectronics integration, and AI-ready network architectures

6GSNS

SMART NETWORKS AND SERVICES
JOINT UNDERTAKING

THANK YOU FOR YOUR ATTENTION

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