



Advanced MEMS for RF and Millimeter Wave Communications

Network of Excellence/ IST/ 2004-2007 Contract No 507352,
Coordinator: LAAS CNRS, Toulouse, France/Univ. Perugia Italy

This Network of Excellence incorporates the new concept called **“Advanced MEMS for RF and millimeter wave communications”** and provide the knowledge base and technical know-how that will be able to address the complexity of desired future communication systems.

Common research work is performed via three **North Star Projects (NSP)**.

IMT-Bucharest is involved in:

- **MMID – Millimeter Wave Identification systems**
- **ReRaFE – Reconfigurable Radio Front-End.**

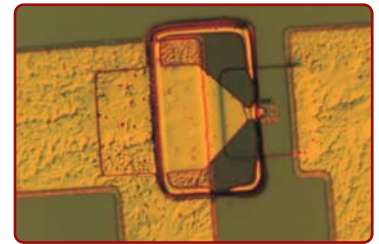
Micromachined monolithic integrated receivers for 60 GHz based on Yagi-Uda antennae, manufactured on GaAs
MMID North Star Project – Millimeter wave TAG
Joint research activities of IMT, FORTH, VTT



The receiver structure used as millimeter wave tag (top and bottom view)

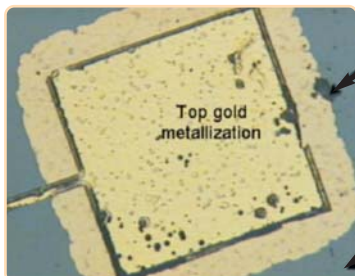
First Millimeter Wave Identification TAG measurements performed by IMT & VTT in Helsinki - August 2006

The MMID concept was demonstrated at a distance of about 1.5 m.



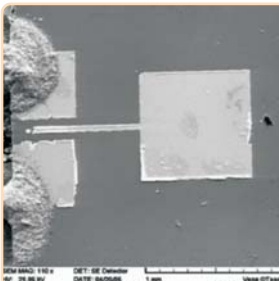
Details of the monolithic integrated Schottky region from the micro-machined monolithic integrated receiver for 60 GHz

Film-Bulk Acoustic Resonator (F-BAR) - ReRaFE North Star Project
Joint research activities of IMT, FORTH, TUD, CRANUNI, IMEC



Top optical photo of the active area of the experimental FBAR structure.

Bottom gold under the transparent GaN membrane
GaN on Silicon



SEM photo (top side) of the GaN membrane supported FBAR structure.

Other Joint Research Activities

- Tunable 60 GHz filters - MMID NSP, common research of IMT and LAAS;
- Micromachined tunable band-pass filters for 1.8/5.2 GHz ReRaFE NSP, common research of IMT, ITC, TUM, IMEC.

For details see project web site:

www.amicom.info.

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INTEGRAMplus:

Integrated MNT platforms and services – Service Action

Integrated Project, IST, 2006 - 2008

Coordinator **PhD. Chris Pickering, QitetiQ Ltd., UK**

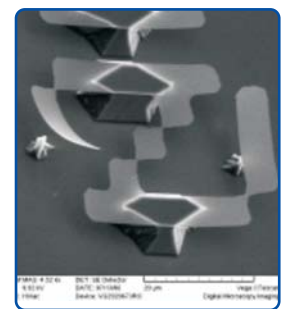
Project abstract: The overall aim of the Service Action Integrated Project is to provide a technology development prototyping platform with a route to manufacture of highly integrated microsystems, combining smart Silicon functionality with polymer platforms in a multi-domain environment.

The combination of the complementary capabilities of the partners and the ability to design, prototype and manufacture via a distributed network will demonstrate a new flexible manufacturing methodology for mixed-technology systems. INTEGRAMplus will aim to overcome these barriers and stimulate take-up of smart microsystems by SMEs in emerging markets.

Project results: IMT worked on calibrating a CAD tool for simulating the silicon anisotropic etching. This was done by etching silicon wafers with a test mask (containing very “sensible” shapes) and comparing the results with the simulations.

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Project web page: www.integramplus.com



SEM picture: silicon anisotropic etching with a test mask