Millimeter Wave Microsystem Application Potential

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Business from technology

Introduction

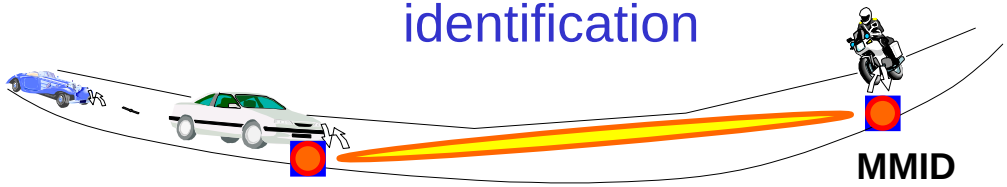
- Millimeter wave (30-300 GHz) and teraherz (300 GHz -) frequencies with new application and technological solutions offer interesting area for joint projects

- This presentation is divided into four parts:
  - Millimeter wave identification - MMID
  - Millimeter wave test and measuremt
  - MEMS-4-MMIC technology

Millimeter Wave Identification - MMID

Millimeter Wave Identification (MMID) Vision

Radar compatible identification

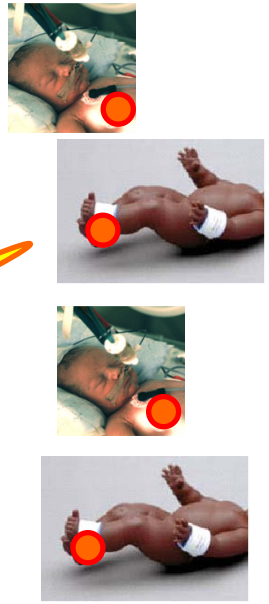


MMID Reader and tag

MMID Reader and tag

Localized identification and sensing

MMID reader



MMID tag including sensors

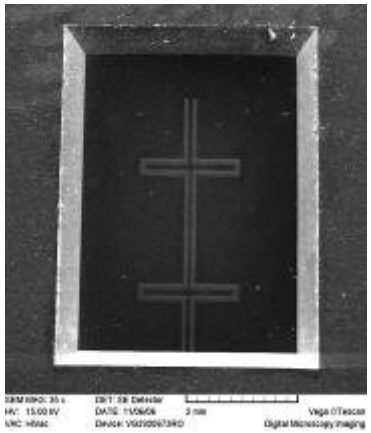
Fast video download

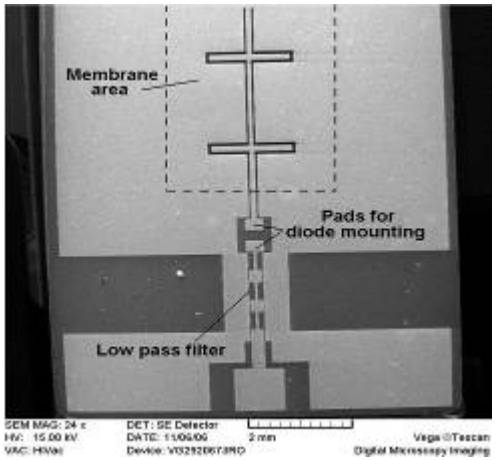
MMID reader

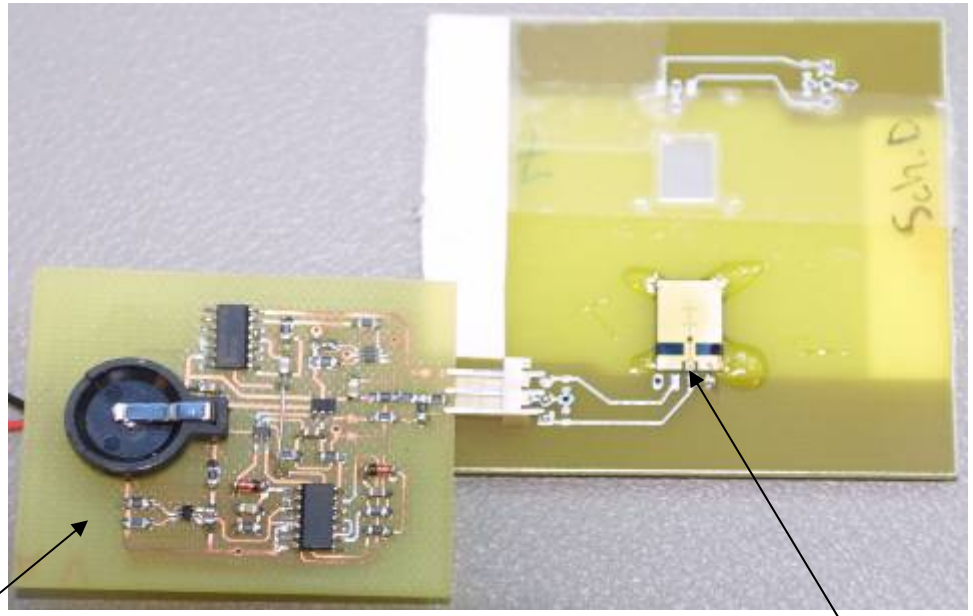
MMID tag with mass memory

77 GHz MMID Tags

- **Hybrid integrated micromachined tag at 77 GHz**
- **Double folded slot antenna on a membrane with a flip chipped schottky diode**



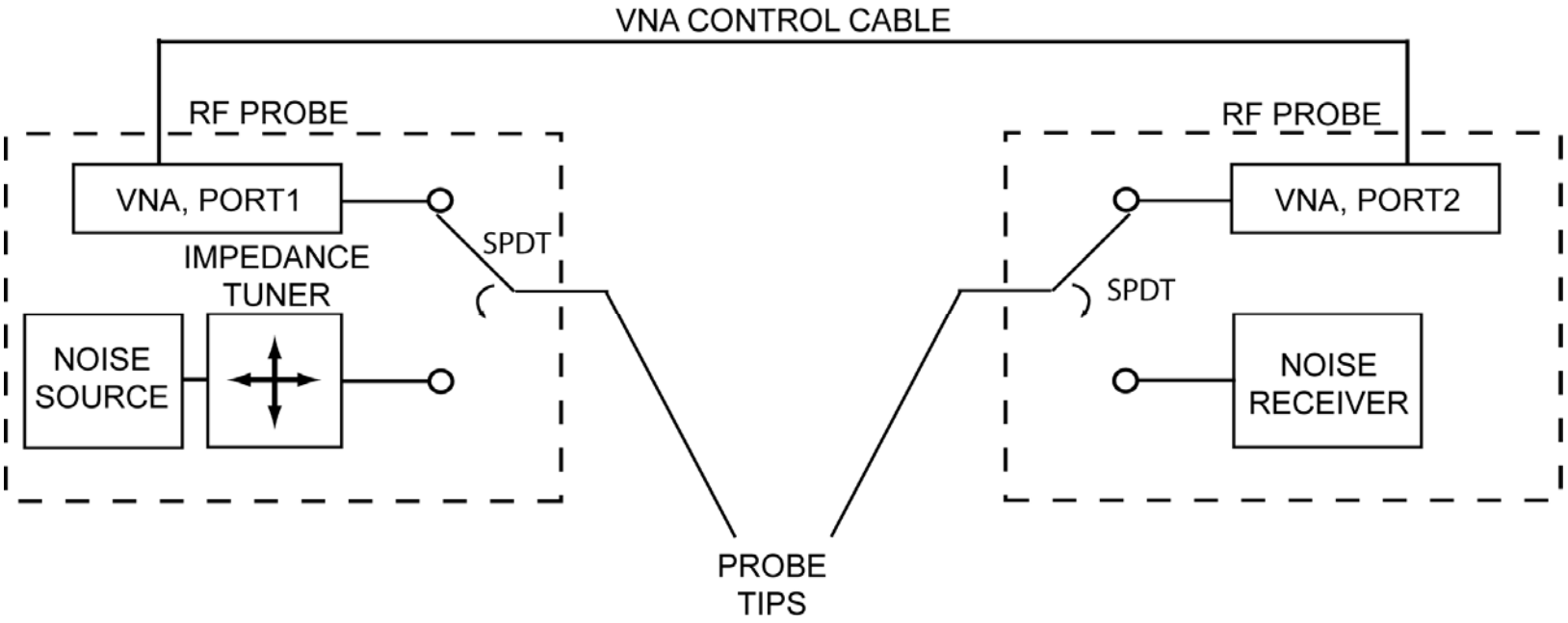




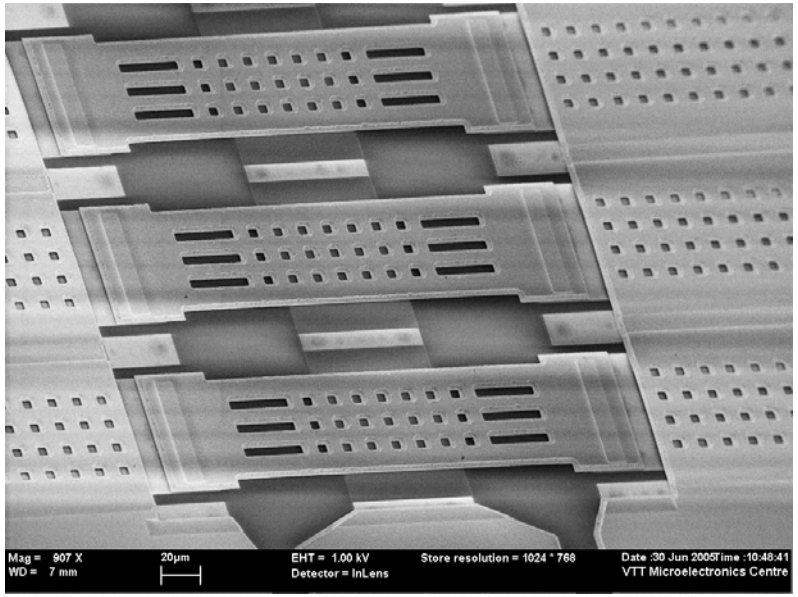
- **Baseband electronics at 900 MHz**
- **Tag: MM-wave diode + antenna**

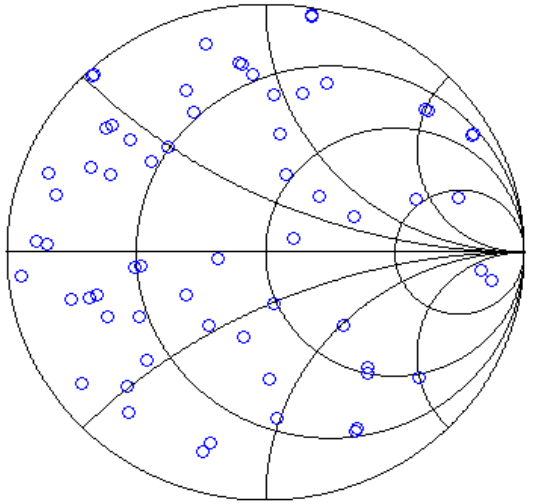
Millimeter Wave Test and Measurement Applications

Millimeter Wave Test and Measurement Applications: Vision for Millimeter Wave Probes with all Electronics Inside



RF MEMS Impedance Tuners for Transistor and Amplifier Characterization





Measured impedance coverage at 60 GHz

Millimeter wave imaging for automotive applications

Monolithic integration of RF MEMS and MMICs
MEMS-4-MMIC FP7 Project

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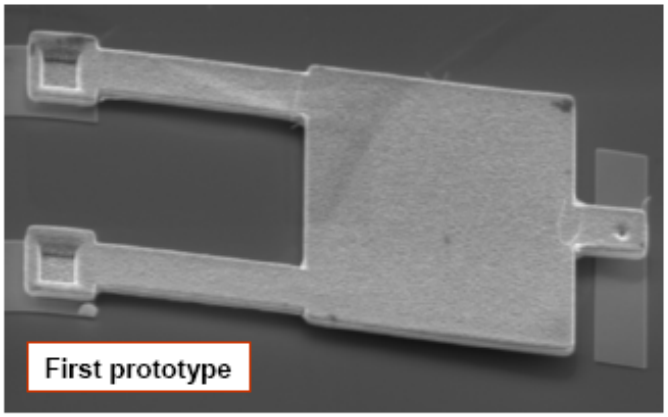
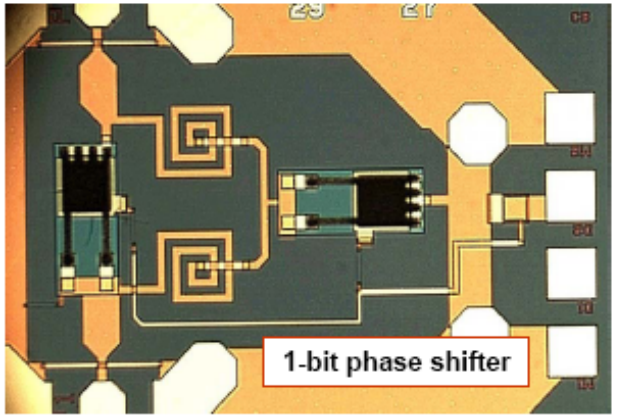
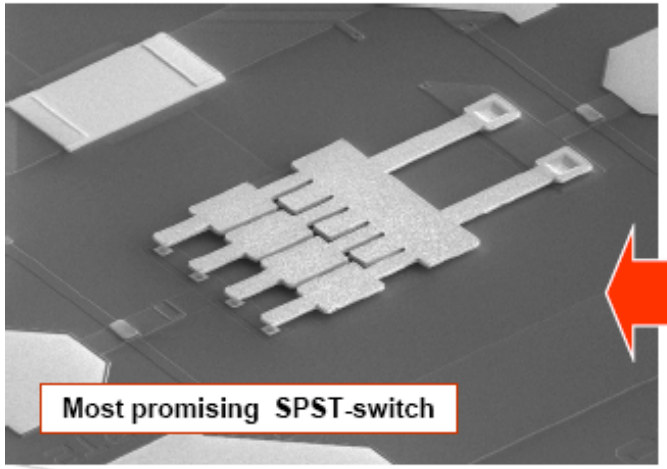
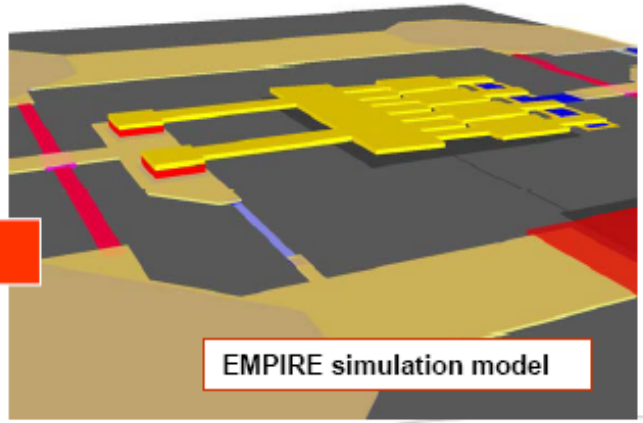
MEMS-4-MMIC FP7 Project









Conclusions

- Many applications are foreseen for millimeter wave microsystems
- Killer application still needs be found
- Technology development to commercially level needed

VTT creates business from technology