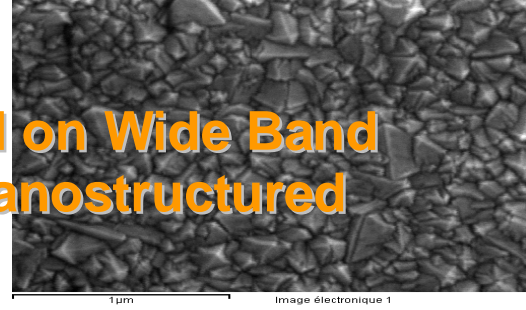
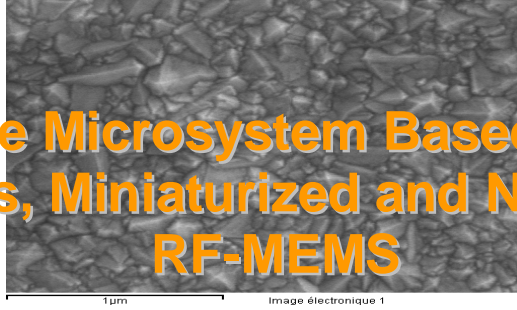
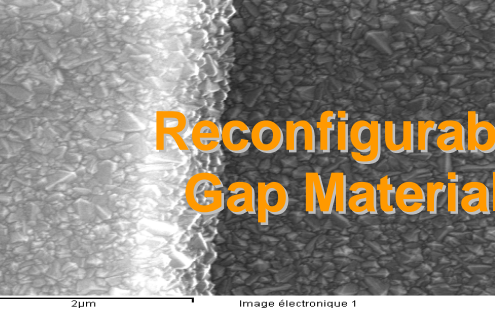


Reconfigurable Microsystem Based on Wide Band Gap Materials, Miniaturized and Nanostructured RF-MEMS

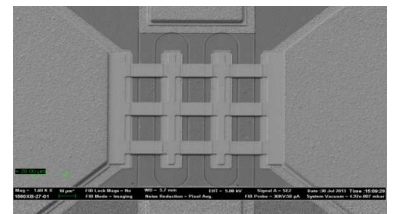
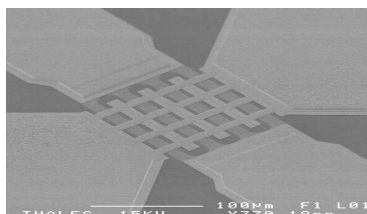
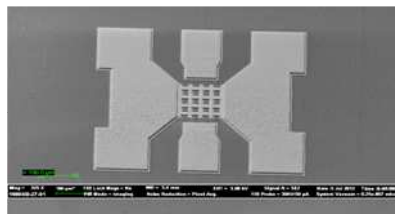
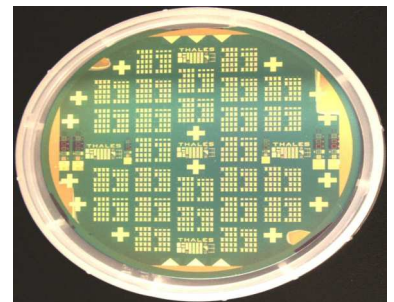
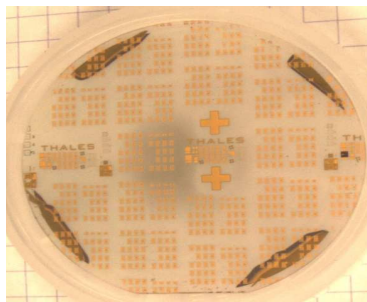
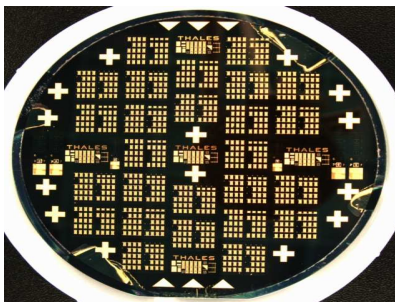


Newsletter #3 (APRIL 2014)

Understanding Charge Mechanisms in different dielectric materials (NKUA, FORTH, IEF, CEA, TRT)

- ✓ Understanding of transport parameters in nanocrystalline diamond
- ✓ Determination of optimum Boron doping range in nanocrystalline for MEMS
- ✓ Construction of a roadmap for MEMS capacitive switches lifetime prediction
- ✓ Measurement of discharge times in the range of 2.5×10^5 sec (3 days) for 40% to 80% surface potential decay
- ✓ Measurement of discharging behaviour via opposite electrode in PZT MIM on Si/SiO₂ substrate, $\tau \approx 10^3$ sec.
- ✓ Study of TiO₂ MEMS reveals promising discharging

MINIMEMS Technology Development (TRT)



Substrate : Si/SiO₂

Air-Gap : 700 nm

Substrate : GaN/Sapphire

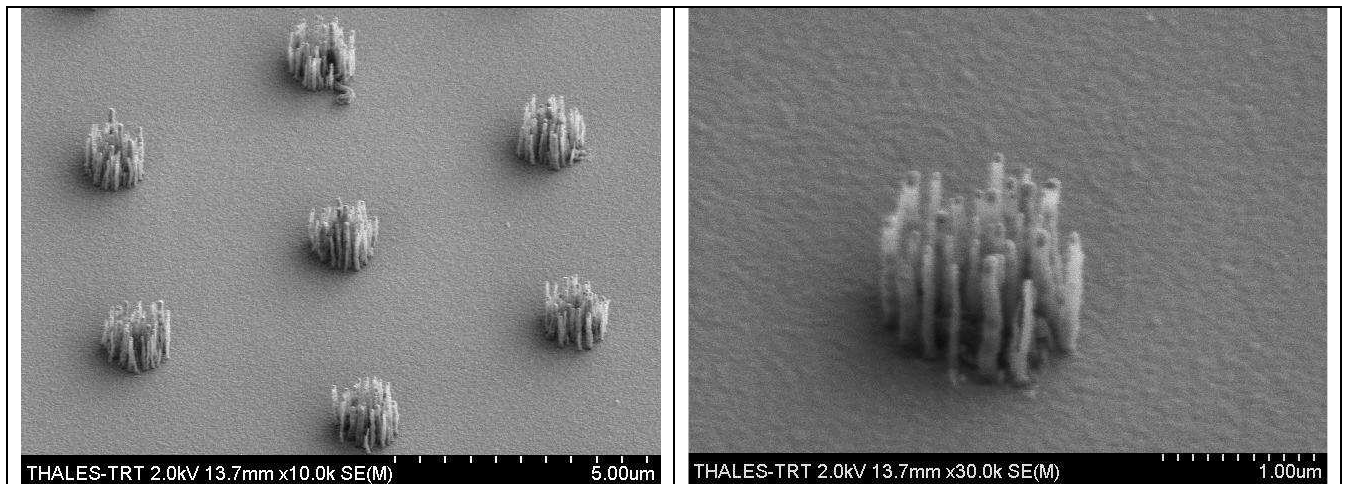
Air-Gap : 500 nm

Substrate : Si/SiO₂

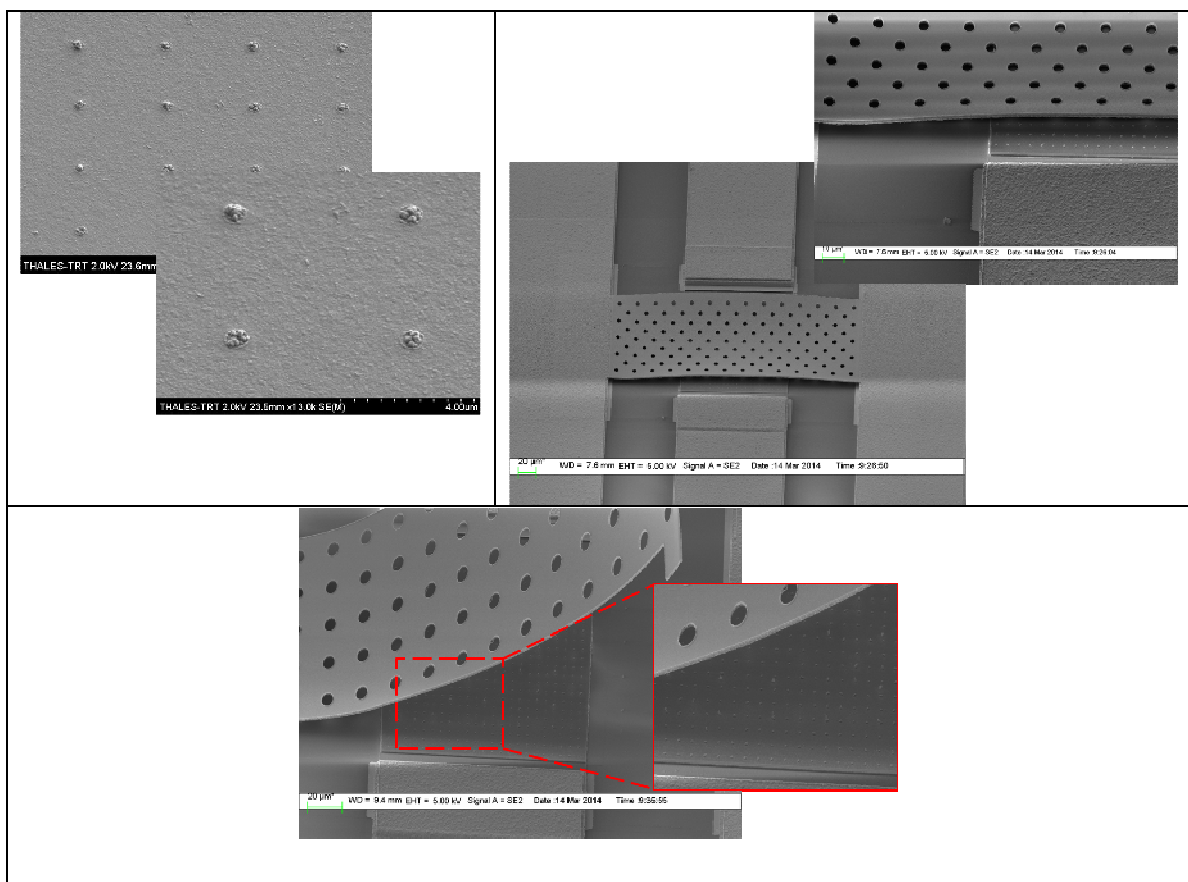
Air-Gap : 300 nm

- ✓ Demonstration of MINIMEMS technology on various substrates with different air gaps

*Validation of growth of CNTs on Si/SiO₂ (HR substrate)
(SHT & TRT)*



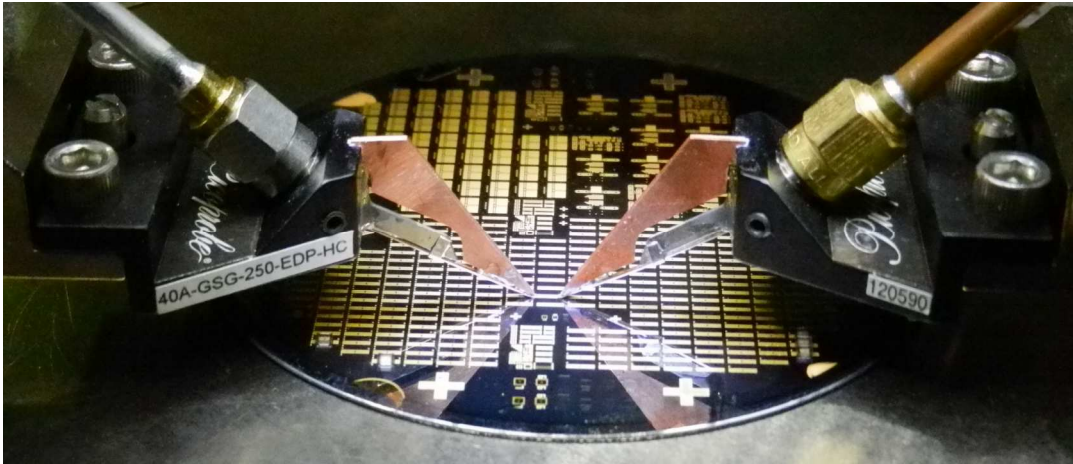
*Demonstration of RF MEMS with CNTs integrated in the Si₃N₄
dielectric material
(SHT, TRT)*



✓ **Demonstration of the feasibility of integrating CNTs in the Si₃N₄ dielectric material of the RF MEMS**



Reliability measurement on TiO₂-based RF MEMS and RF MINIMEMS

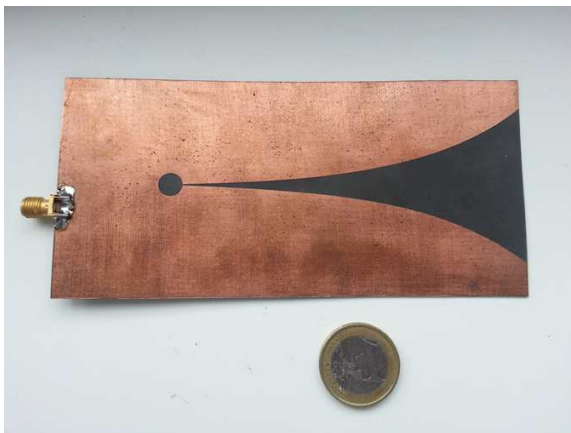


- ✓ *Si/SiO₂ RF MEMS*
- ✓ *Reliability up to 10⁸ cycles*
- ✓ *Power handling up to 15W*
- ✓ *Power handling reliability at 15W, 10⁷ pulses*

- ✓ *Packaged devices*
- ✓ *Power handling validated up to 10W*
- ✓ *Power handling reliability 5.10⁶ pulses at 10W*

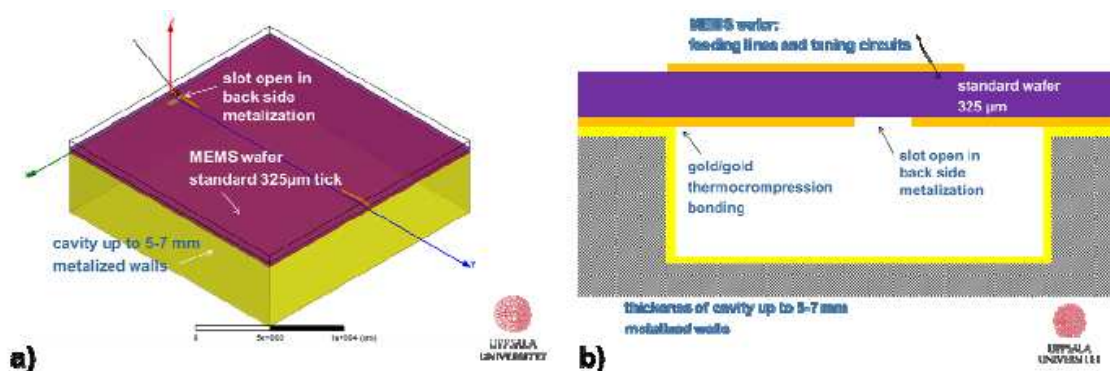
- ✓ *GaN MiniMEMS*
- ✓ *Reliability up to 5.10⁶ cycles*
- ✓ *Power handling 10W and 5.10⁶ pulses*

UWB antenna development (UU)



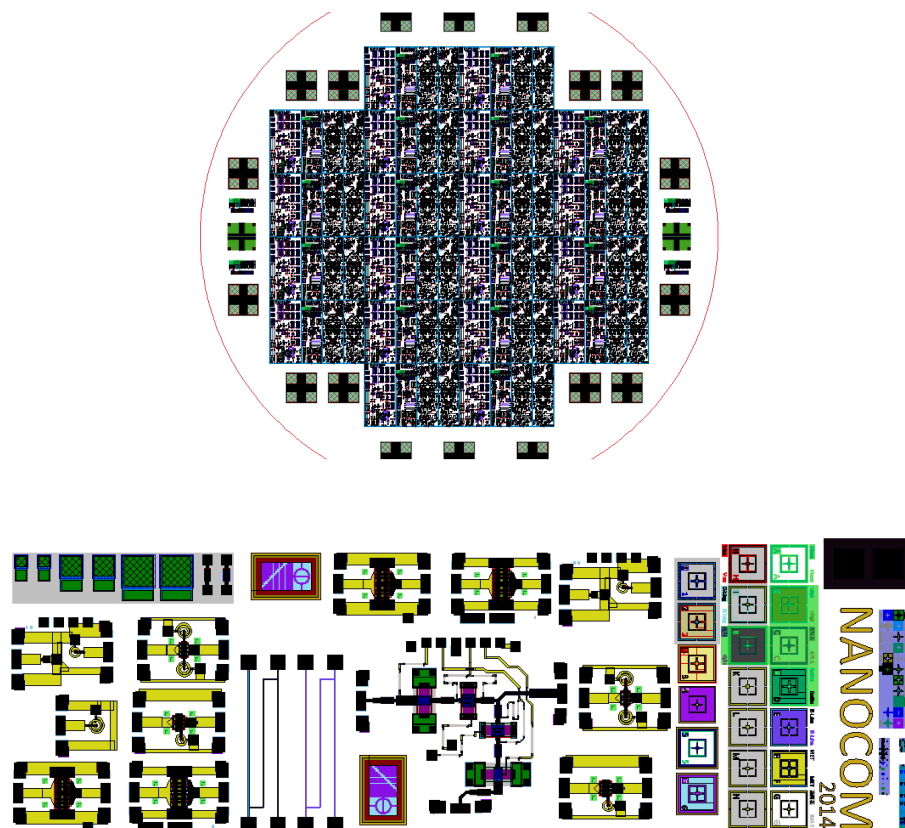
- ✓ *Demonstration of the front and back end of the antenna to be used for the reconfigurable network demonstrator*

Demonstration of a tunable filter design based on RF MEMS (UU, TRT)



- ✓ Validation of the design of a tunable filter based on RF MEMS. Mask design in progress

T/R module technology development on GaN/Si (FORTH, TRT)



- ✓ Validation of the design of the T/R module on GaN/Si & Mask set has been realized. Processing ongoing