# Study of micro-fluidic cooling systems co-integrated with microwave devices

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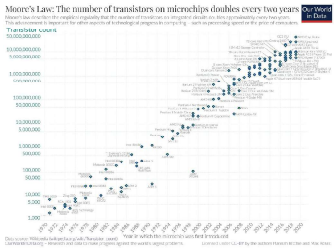
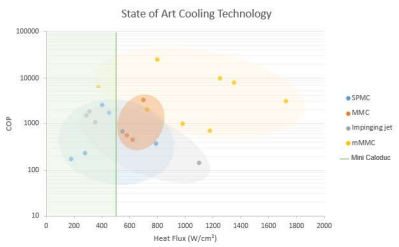
Current compact architectures of Radio-Frequency (RF) communication systems generate considerable heat fluxes, which are difficult to dissipate. The generated heat is becoming the limiting factor to apply more power to RF systems leading to malfunctions or failure of the entire system. The objective of this work is to propose a structure to extract these high heat fluxes.

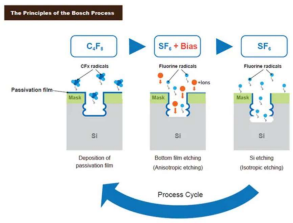
## Introduction

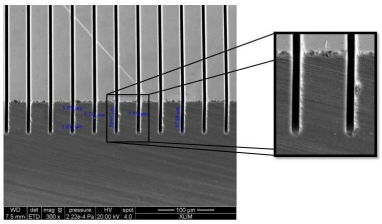


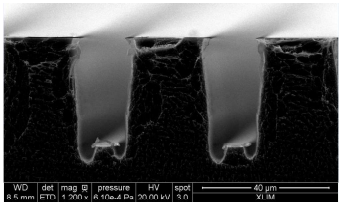

## Fabrication Process

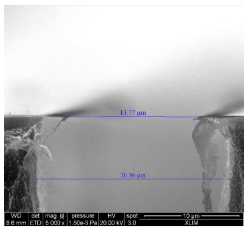
- Straight holes etch with Bosch process



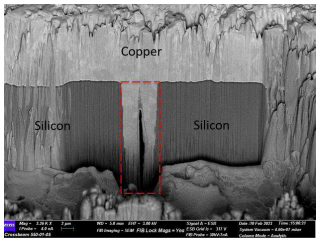



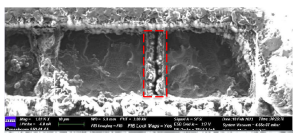
- Enlargement under a protection layer





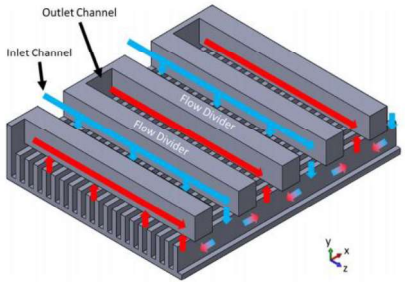
- Sealing of the microchannels

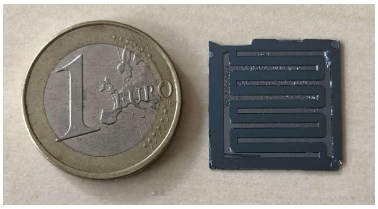


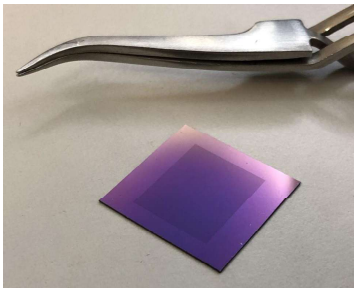



## Manifold Microchannel

**Manifold** enable the reduction of pressure drop





## Conclusion and Perspectives

- Manifold structure enable a better cooling performance due to its architecture and the proximity with the heat source
- Some prototypes are actually fabricated to proceed to electrical and fluidic test