

Electro-Thermal Modeling of Dual-Heater Indirectly Heated, Inline, Phase-Change RF Switches

Radiofrequency (RF) switches based on phase-change materials (PCM) have emerged as promising candidates for high-performance RF switches due to their superb transmission properties, small footprint, low switching time and energy, scalability, CMOS compatibility, and non-volatility. We are currently developing the fabrication process of these devices here, at the Technion facilities.

In this project, electro-thermal simulations and modeling of the indirectly heated four-terminal PCM RF switch will be performed in COMSOL Multiphysics. This model will be useful to accurately design and optimize the device.

Schedule:

- Study the working principles of the PCM RF switch.
- Development of a finite-element method (FEM) model for the dual-heater PCM RF switch.
- Adaptation of the single-heater compact model to match the dual-heater behavior.
- Development of the model in Verilog-A.

Prerequisites: Introduction to Semiconductors, Linear Circuits

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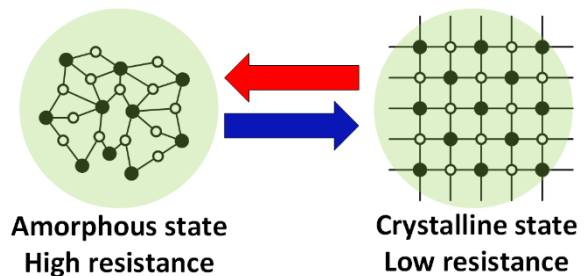
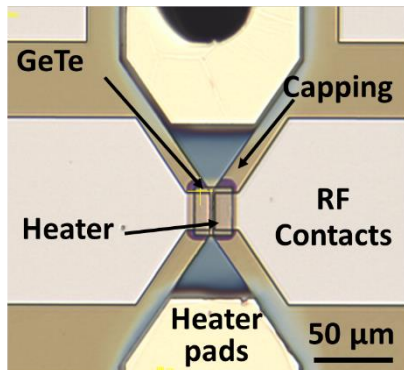


Figure 2- Phase transition in PCM switches

Figure 1 – Optical view of the fabricated PCM switch