This work involves the design and fabrication of silicon chips used for the characterization and verification tests of two-phase cooling of 3D integrated microprocessors. The chips comprise microheaters emulating the power dissipated by active components in a CMOS chip, resistive-thermal-devices (RTD) as temperature sensors, backside micro-channels in various dimensions and configurations, and finally a pyrex cover for both channel sealing and visual inspection.

Test device with front-side hotspot heaters and back-side microchannels, sealed with an o-ring for two-phase micro-channel cooling experiments. Completely designed and manufactured at EPFL.

Silicon test device with anodically-bonded pyrex cover for sealing and visual inspection.

**2nd Generation – Fabricated Structures**

- Photos show front and back sides of the fabricated wafer before anodic bonding and dicing.
- Each chip has two microheaters enabling uniform temperature distribution and four RTDs as temperature sensors.