

## Supplementary information

### **IDT Fabrication**

The SAW device was fabricated on a 128° Y-cut X-propagating 3 inch LiNbO<sub>3</sub> wafer and it consisted of 10 pairs of electrodes to form an interdigital transducer (IDT). The electrodes separation ( $D/2$ ) and their width ( $D/2$ ) varied linearly from 62.5 μm to 125 μm along the aperture. The LiNbO<sub>3</sub> wafer was coated by spinning AZ4562 photoresist. The pattern was transferred using standard photolithography and developed using AZ400K. A 20 nm titanium adhesion layer was evaporated prior to deposition of 100 nm of gold and the lift-off was then performed in acetone. The wafer was finally fixed with thermal paste on a heat sink to avoid heating of the device.

### **Fabrication of glass chip**

The disposable superstrate was fabricated using a glass coverslip (22x22 mm, 0.2 mm thick). The glass was coated with AZ4562 photoresist and patterned using standard photolithography. It has been developed using AZ400K. The pattern comprised an array (pitch 200 μm) of circular dots (radius 80 μm). The glass was then treated in O<sub>2</sub> Plasma for 2 min at 100 W before silanisation in a solution of 30 μl of trichloro(1H,1H,2H,2H-perfluorooctyl)silane (Aldrich) in 50 ml of heptane for 10 min. The photoresist was removed in acetone and the glass was rinsed with methanol and blow dried.