

Supplementary Figures

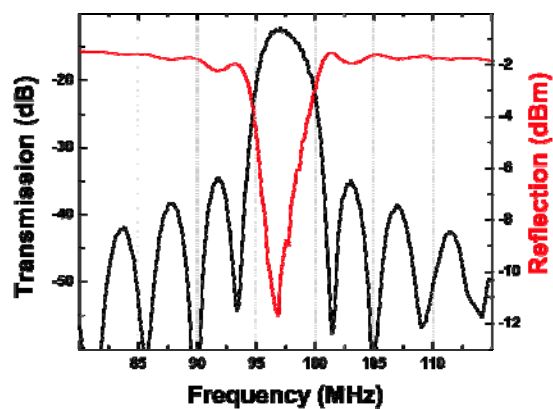


Fig. S1: N3-S3 delay line transmission (Black) and N3 reflection (Red) characteristics.

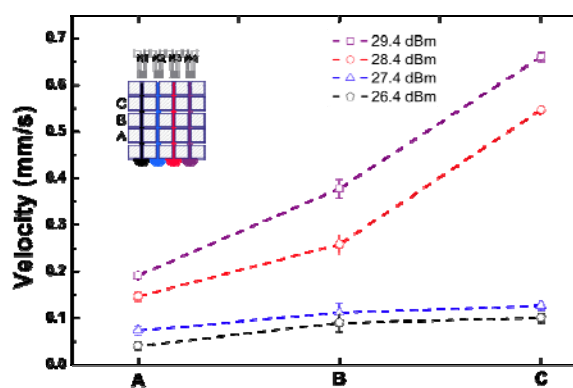


Fig. S2: Liquid injection dynamics during single microchannel fillings. Average meniscus velocities at different P_{RF} are reported during liquid transfer through different regions of the microchannel grid. A, B and C identify these positions. Error bars quantify the reproducibility of the filling processes.

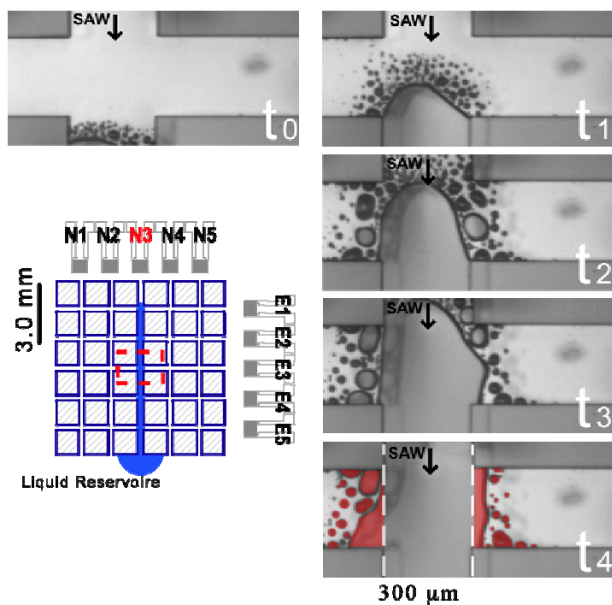


Fig. S3: Single microchannel filling. Typical filling sequence showing the meniscus evolution at a channel crossing. N3 was powered at 26.4 dBm. The frame t4 highlights the liquid leakage the lateral microchannels, estimated as $\sim 10\%$ of the total injected volume.

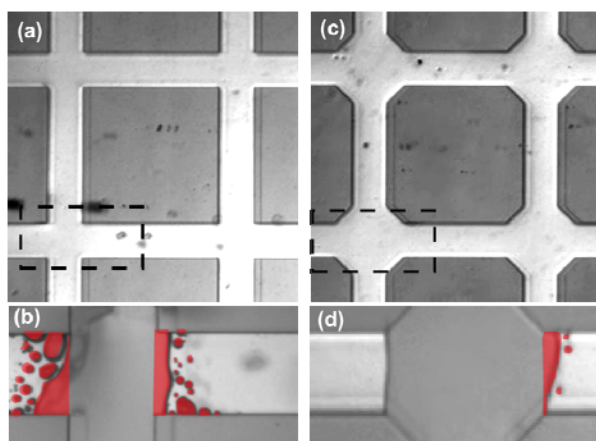


Fig. S4: Filling of microchannels having different cross-area geometry. (a) Standard grid layout. (b) Water leakage ($\sim 10\%$) into lateral microchannels during single microchannel filling. (c) Alternative grid layout. (d) Reduced leakage (2.5%) at the cross section during single microchannel filling.

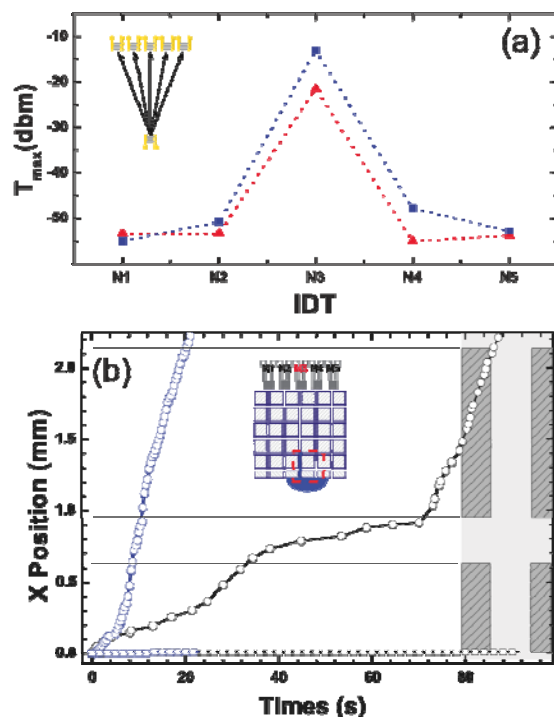


Fig. S5: (a) Maximum of the transmission characteristics between S3 and N1-5. Measurement carried out with (triangles) and without (squares) the presence of the fluidic layer touching the substrate surface. (b) Fluidic cross-coupling quantification. Meniscus position evolution at $P_{RF} = 32$ dBm (blue) and $P_{RF} = 28.4$ dBm (black). The circles and squares refer to the channels N3-S3 (aligned to the active IDT) and N4-S4 (nearby the active IDT), respectively.

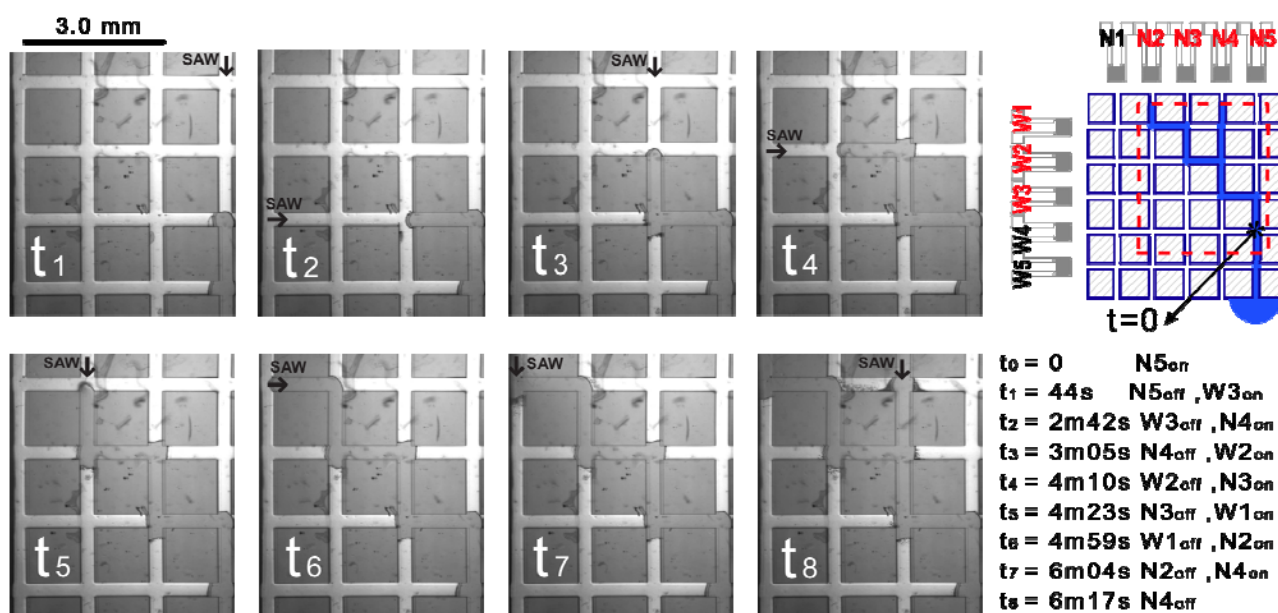


Fig. S6: Micropumping cycle exploiting 7 different SAW micropumps acting along a network of 7 microchannels, containing 6 cross areas for a total fluidic volume of 500 nl. The final liquid pattern (t₈) was achieved by inducing 6 direction changes (from t₂ to t₇) and one fluid split

Supplementary Material (ESI) for Lab on a Chip

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(t₈).