

Atomic Layer Deposited AZO on Lithium Niobate: A Scalable Platform for RF Energy Harvesting and Frequency Mixing

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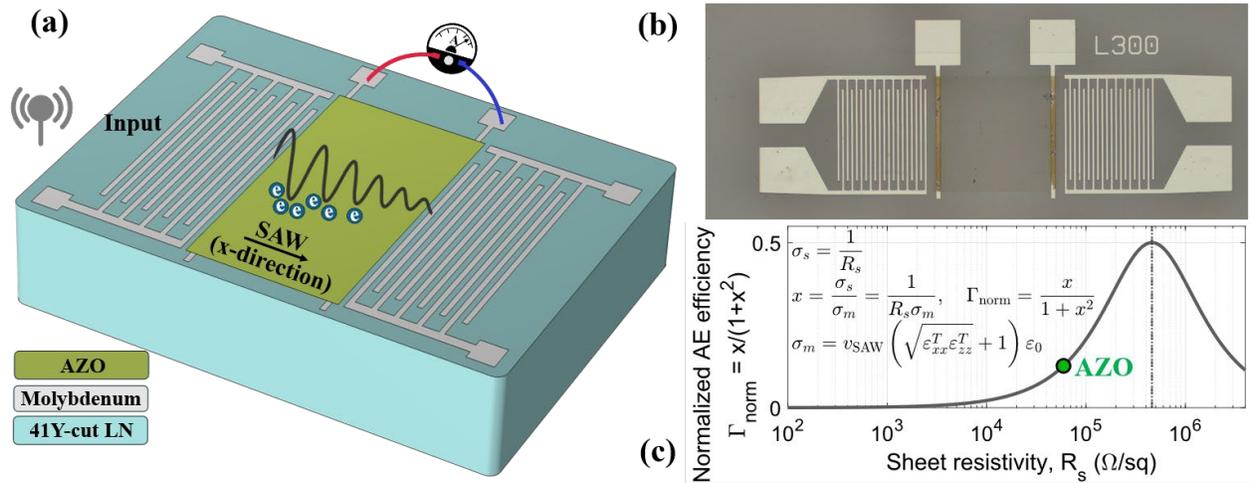


Fig. 1. Schematic of the AZO/LN SAW delay line (a), optical micrograph of a fabricated device (b), and analytical AE efficiency versus AZO resistivity for AZO-on-LN, with the measured AZO resistivity indicated (c).

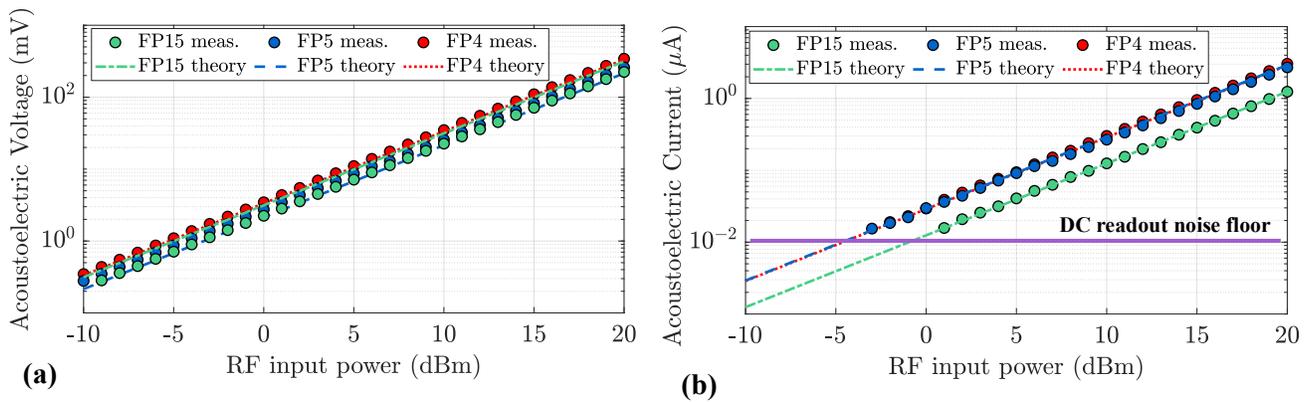


Fig. 2. Measured AE voltage (a) and current (b) versus input RF power for AZO/41Y-LN devices, showing linear RF-to-DC conversion in agreement with analytical predictions. DC noise floor is believed to limit the minimum detection range. [3].

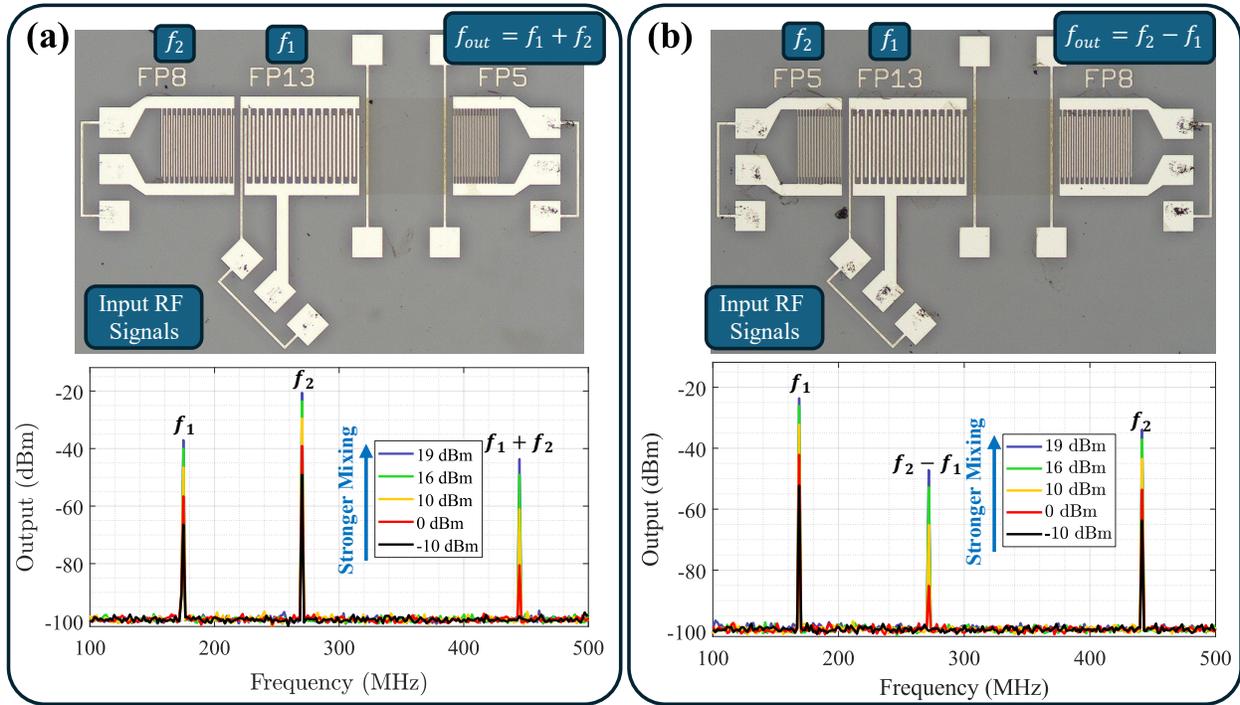


Fig. 3. AE SAW mixer demonstrations: (a) Sum mixer: $f_1 = 175$ MHz and $f_2 = 270$ MHz, output at $f_1 + f_2 = 445$ MHz. (b) Difference mixer: $f_1 = 169$ MHz and $f_2 = 441$ MHz, output at $f_2 - f_1 = 272$ MHz. Optical micrographs of the fabricated devices are shown above each spectrum. The mixed-tone level increases with RF input power (-10 to +19 dBm input power sweep shown).