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(54) **SURFACE ACOUSTIC WAVE DEVICES AND RELATED METHODS**

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(57) **ABSTRACT**

Surface acoustic wave devices and related methods. In some embodiments, a surface acoustic wave device for providing resonance of a surface acoustic wave having a wavelength λ can include a quartz substrate and a piezoelectric plate formed from $LiTaO_3$ or $LiNbO_3$ disposed over the quartz substrate. The piezoelectric plate can have a thickness greater than 2λ. The surface acoustic wave device can further include an interdigital transducer electrode formed over the piezoelectric plate. The interdigital transducer electrode can have a mass density ρ in a range 1.50 g/cm^3<ρ≤6.00 g/cm^3, 6.00 g/cm^3<ρ≤12.0 g/cm^3, or 12.0 g/cm^3<ρ≤23.0 g/cm^3, and a thickness greater than 0.148λ, greater than 0.079λ, or greater than 0.036λ, respectively.