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(54) **ACOUSTIC RESONATOR LID FOR THERMAL TRANSPORT**

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(57) **ABSTRACT**

An apparatus for filtering radio frequency signals is provided. The apparatus includes a substrate and a membrane coupled to the substrate that includes piezoelectric material. The apparatus also includes an interdigital transducer (IDT) coupled to the membrane and includes a plurality of interleaved fingers. The apparatus also includes a lid, in which the membrane is arranged between the substrate and the lid with a first cavity having a first height between the lid and a first main surface of the membrane and a second cavity having a second height between the substrate and a second main surface of the membrane that opposes the first main surface. Moreover, the first height between the lid and the first main surface of the membrane is greater than a pitch of at least one pair of interleaved fingers of the plurality of interleaved fingers and at most four times greater than the second height.

