



US 20220360246A1

(19) **United States**(12) **Patent Application Publication****Zhang et al.**(10) **Pub. No.: US 2022/0360246 A1**(43) **Pub. Date: Nov. 10, 2022**

(54) **TRANSVERSELY-EXCITED FILM BULK ACOUSTIC RESONATOR FABRICATION USING A PIEZOELECTRIC PLATE, SILICON SUBSTRATE AND HANDLE WAFER SANDWICH**

H03H 9/13 (2006.01)*H03H 9/17* (2006.01)(52) **U.S. Cl.**

CPC *H03H 9/02228* (2013.01); *H03H 3/04* (2013.01); *H03H 9/02102* (2013.01); *H03H 9/02133* (2013.01); *H03H 9/13* (2013.01); *H03H 9/174* (2013.01); *H03H 2003/023* (2013.01)

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(21) Appl. No.: **17/565,271**(22) Filed: **Dec. 29, 2021****Related U.S. Application Data**

(63) Continuation of application No. 17/565,123, filed on Dec. 29, 2021.

(60) Provisional application No. 63/185,465, filed on May 7, 2021.

Publication Classification(51) **Int. Cl.***H03H 9/02* (2006.01)*H03H 3/04* (2006.01)

(57)

ABSTRACT

An acoustic resonator device is formed that reduces a thermal coefficient of expansion mismatch between a piezoelectric plate and a silicon substrate by bonding the front surface of the silicon substrate having a filled and planarized sacrificial tub to a piezoelectric substrate and thinning the silicon substrate by removing material from a back surface. That back surface is then bonded to a handle wafer having a thermal coefficient of expansion (TCE) closer to a TCE of the piezoelectric substrate than a TCE of the silicon substrate and thinning the piezoelectric substrate to a target piezoelectric membrane thickness to form a piezoelectric plate. A conductor pattern is formed on the thinned piezoelectric plate and the sacrificial tub is removed to form a cavity and release a membrane of the piezoelectric plate using an etchant introduced through holes in the piezoelectric plate.

