



US 20240235521A1

(19) **United States**

(12) **Patent Application Publication**
YAMANE et al.

(10) **Pub. No.: US 2024/0235521 A1**

(43) **Pub. Date: Jul. 11, 2024**

(54) **ACOUSTIC WAVE DEVICE AND METHOD FOR MANUFACTURING ACOUSTIC WAVE DEVICE**

H03H 9/05 (2006.01)

H03H 9/13 (2006.01)

H03H 9/17 (2006.01)

(71) Applicant: **Murata Manufacturing Co., Ltd.**,
Nagaokakyo-shi (JP)

(52) **U.S. Cl.**

CPC *H03H 9/105* (2013.01); *H03H 3/02*

(2013.01); *H03H 9/02031* (2013.01); *H03H*

9/02157 (2013.01); *H03H 9/02228* (2013.01);

H03H 9/0523 (2013.01); *H03H 9/132*

(2013.01); *H03H 9/173* (2013.01); *H03H*

9/176 (2013.01); *H03H 2003/021* (2013.01)

(21) Appl. No.: **18/611,815**

(57)

ABSTRACT

(22) Filed: **Mar. 21, 2024**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2022/036781, filed on Sep. 30, 2022.

(60) Provisional application No. 63/250,547, filed on Sep. 30, 2021.

Publication Classification

(51) **Int. Cl.**

H03H 9/10 (2006.01)

H03H 3/02 (2006.01)

H03H 9/02 (2006.01)

An acoustic wave device includes an acoustic wave element including a support including a support substrate having a thickness in a first direction, a piezoelectric layer laminated on the support portion and including a first main surface and a second main surface opposite to the first main surface in the first direction, and a functional electrode on at least one of the first main surface and the second main surface of the piezoelectric layer, and a package to house the acoustic wave element. The support portion includes a first space on a piezoelectric layer side at a position where the first space at least partially overlaps the functional electrode in a plan view in the first direction, the package includes a second space outside the first space, and the piezoelectric layer includes a through-hole communicating with the first space and the second space.

