US 20220352874A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2022/0352874 A1

NAKAMURA et al. (43) Pub. Date: Nov. 3, 2022

(54) **ACOUSTIC WAVE DEVICE, AND LADDER FILTER INCLUDING THE SAME**

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

(72) Inventors: **Kentaro NAKAMURA**, Nagaokakyo-shi (JP); **Shinichi OKADA**, Nagaokakyo-shi (JP); **Syunsuke KIDO**, Nagaokakyo-shi (JP)

(21) Appl. No.: **17/869,808**

(22) Filed: **Jul. 21, 2022**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2021/003249, filed on Jan. 29, 2021.

(30) **Foreign Application Priority Data**

Jan. 31, 2020 (JP) 2020-015068

Publication Classification

(51) **Int. Cl.**

H03H 9/64	(2006.01)
H03H 9/02	(2006.01)
H03H 9/25	(2006.01)
H03H 9/145	(2006.01)

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

CPC ***H03H 9/6483*** (2013.01); ***H03H 9/02574*** (2013.01); ***H03H 9/25*** (2013.01); ***H03H 9/02842*** (2013.01); ***H03H 9/145*** (2013.01)

(57) **ABSTRACT**

An acoustic wave device includes a substrate, a first resonator, a second resonator, and a shared reflector. The second resonator is adjacent to the first resonator and has different frequency characteristics different than the first resonator. The first resonator includes a first interdigital transducer electrode. The second resonator includes a second interdigital transducer electrode. The shared reflector has frequency characteristics that are the same as both frequency characteristics of the first resonator and frequency characteristics of the second resonator or between the frequency characteristics of the first resonator and the frequency characteristics of the second resonator. a higher-order mode frequency of the first resonator and a higher-order mode frequency of the second resonator coincides. When the number of electrode fingers of the shared reflector is even, an electrode finger facing the shared reflector in the first interdigital transducer electrode and an electrode finger facing the shared reflector in the second interdigital transducer electrode have the same polarity. When the number of electrode fingers of the shared reflector is odd, an electrode finger facing the shared reflector in the first interdigital transducer electrode and an electrode finger facing the shared reflector in the second interdigital transducer electrode have opposite polarities.