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(54) **PIEZOELECTRIC THIN FILM,
PIEZOELECTRIC THIN FILM ELEMENT
AND PIEZOELECTRIC TRANSDUCER**

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(57) **ABSTRACT**

Provided is a piezoelectric thin film containing a tetragonal crystal **1** of a perovskite type oxide and a tetragonal crystal **2** of the oxide. A (001) plane of the tetragonal crystal **1** and a (001) plane of the tetragonal crystal **2** are oriented in a normal direction of a surface of the piezoelectric thin film. An interval of the (001) plane of the crystal **1** is c_1 . An interval of a (100) plane of the crystal **1** is a_1 . An interval of the (001) plane of the crystal **2** is c_2 . An interval of a (100) plane of the crystal **2** is a_2 . c_2/a_2 is more than c_1/a_1 . A peak intensity of diffracted X-rays of the (001) plane of the crystal **1** is I_1 . A peak intensity of diffracted X-rays of the (001) plane of the crystal **2** is I_2 . $I_2/(I_1+I_2)$ is from 0.50 to 0.90.

