

Determination of the Orientations and Microstructures of Pb(Zr,Ti)O Films Fabricated on Different Substrate Structures

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Piezoelectric (PZT) films with different orientations and microstructures were fabricated on different substrate structures in one chip. To investigate the substrate structural effect of Pb(Zr_{0.52}Ti_{0.48}) films, different substrate structures of a Pt membrane and Pt on a Si substrate (called platinized Si) were fabricated after Si back-side etching. The PZT films were fabricated on the prepared substrates by RF magnetron sputtering with a single oxide target. After the annealing of a PZT film, different microstructures and Orientations were observed from different parts of the sample. The PZT film on the Pt membrane has (001) orientation and grains of ~1 μm size. On the other hand, the PZT film on platinized Si has (111) orientation and grains of ~3 μm size.

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