

課題番号 : F-19-TU-0125  
 利用形態 : 機器利用  
 利用課題名(日本語) :  
 Program Title (English) : PZT resonator  
 利用者名(日本語) :  
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 キーワード/Keyword : 成膜・膜堆積、ゾルゲル、圧電体

### 1. 概要(Summary)

The resonator was fabricated by using PZT thin film, and the quality of PZT thin film to resonator was evaluated. Also verify that the simulated and measured resonance frequency are consistent.

### 2. 実験(Experimental)

【利用した主な装置】

ゾルゲル自動成膜装置

【実験方法】

Resonator was made using PZT deposited film equipment. First it is deposited PZT on the SOI wafer, then the pattern is defined by the lithography process, metal electrodes are evaporated by the lift off process, the structure is defined by ICP dry etching, and the structure is finally released by DRIE dry etching. And use a network analyzer to measure resonator result.

### 3. 結果と考察(Results and Discussion)

Fig.1 shows the results of the fabrication process, with Au metal electrodes on the surface PZT film. Fig. 2 is a simulation result with a resonance frequency of 6.32 MHz. Fig. 3 is an actual measurement result with a resonance frequency of 5.91 MHz. The results are quite close.

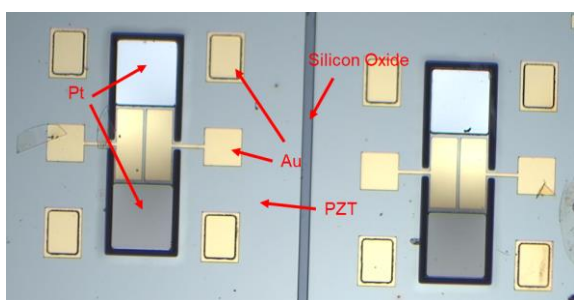


Fig. 1 Fabrication process result.

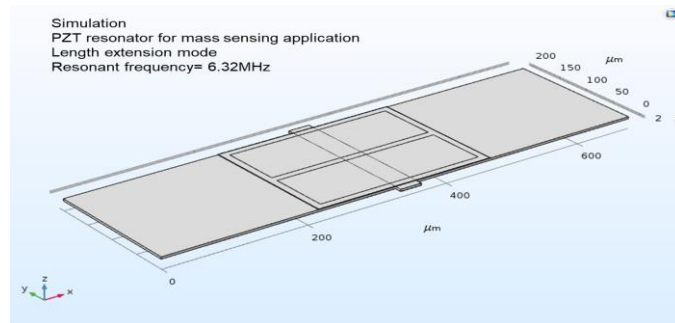


Fig. 2 Simulation result.

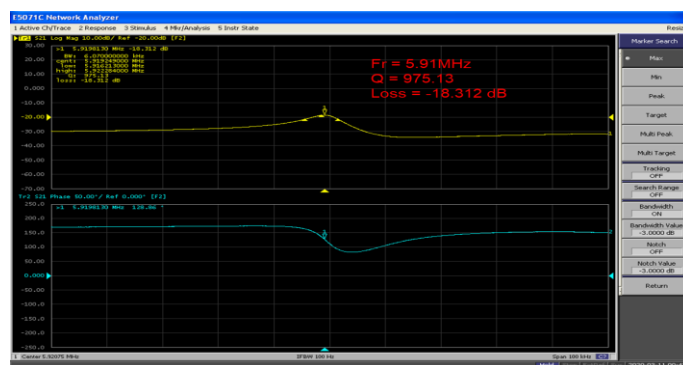


Fig. 3 Measurement result.

### 4. その他・特記事項(Others)

References

- M. Esashi et al., Sensors and Actuators, Vol. 4 (1983), pp 537-544.
- M. Moriyama et al. 異なる市販ゾルを用いたゾルゲル法による PZT 薄膜の成膜と評価, IEEJ (2015).
- T. Tsukamoto et al., Journal of Micromechanics and Microengineering 2017, Vol. 27, No. 9

### 5. 論文・学会発表(Publication/Presentation)

なし。

### 6. 関連特許(Patent)

なし。