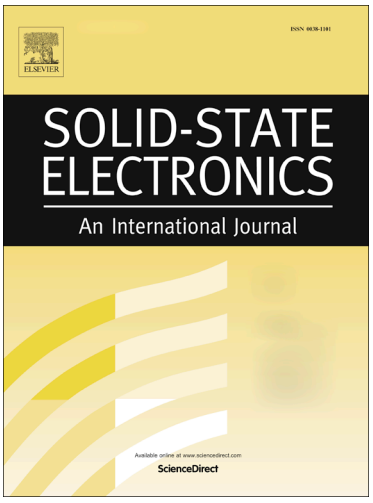

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Jianxiong Zhu, Weixing Song

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Jianxiong Zhu, Weixing Song

Beijing Institute of Nanoenergy&Nanosystems, Chinese Academy of Sciences, National Center for Nanoscience and Technology (NCNST), Beijing 100083, China,
Corresponding Author: danverzhu@gmail.com

Abstract: We report a MEMS fabrication and frequency sweep for a high-order mode suspending beam and plate layer in electrostatic micro-gap semiconductor capacitor. This suspended beam and plate was designed with silicon oxide (SiO_2) film which was fabricated using bulk silicon micromachining technology on both side of a silicon substrate. The designed semiconductor capacitors were driven by a bias direct current (DC) and a sweep frequency alternative current (AC) in a room temperature for an electrical response test. Finite element calculating software was used to evaluate the deformation mode around its high-order response frequency. Compared a single capacitor with a high-order response frequency (0.42 MHz) and a 1×2 array parallel capacitor, we found that the 1×2 array parallel capacitor had a broader high-order response range. And it concluded that a DC bias voltage can be used to modulate a high-order response frequency for both a single and 1×2 array parallel capacitors.

- **KEYWORDS:** Electrical response, Voltage modulation, Electrostatic force, Bulk silicon fabrication

1. Introduction