带有凸条平板的**MEMS**结构压膜阻尼效应分析

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摘　要：

针对带有凸条平板的MEMS结构压膜阻尼效应，利用基本Reynolds方程和特定的第一类边界条件，给出一种压膜阻尼系数的解析分析方法。在带有凸条平板的MEMS微开关设计与制作的基础上，利用引入该压膜阻尼系数的Simulink模型仿真分析了微开关的动态响应特性，得到的阈值加速度与其落锤测试结果是一致的，从而很好地验证了所提出的带有凸条平板压膜阻尼效应理论分析的正确性。

关键词：微机电系统，压膜阻尼，带凸条平板，解析解

An Analysis of Squeeze Film Damping for MEMS Plate Structures with Raised Strips

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Abstract:

To analyze the squeeze film damping effect of MEMS plates with raised strips, an analytical solution is given to calculate the coefficient of squeeze film damping by using Reynolds equation and the first boundary conditions. A MEMS switch with raised strips is designed and fabricated. A Simulink model with the damping coefficient is created to simulate the dynamic response. The consistency of the threshold acceleration in Simulink and the testing results of the dropping hammer system proves the validity of theoretical analysis.

Keywords: MEMS, squeeze film damping, plates with raised strips, analytical solution

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