

一种电容式微机械加速度计的设计

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摘要:

介绍了一种新型基于滑膜阻尼的电容式微机械加速度计.该加速度计根据差分电容极板间正对面积的改变来检测加速度大小,保证了输出电压与加速度之间的线性度.对加速度计进行了结构设计和分析.给出了加速度计的制作工艺流程,研究了解决深反应离子刻蚀过程中的过刻蚀现象的方法.初步测试结果表明,该加速度计的灵敏度比较理想,谐振频率与理论计算相吻合

关键词: 电容式加速度计; 微机电系统; 深反应离子刻蚀; 滑膜阻尼

Study of a Novel Micromachined Capacitive Accelerometer

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Abstract:

A novel micromachined capacitive accelerometer, based on slide-film damping principle, was reported. The acceleration is measured by modifying the effective overlap area of a differential capacitor pair and the linearity between output voltage and acceleration is ensured. The accelerometer was fabricated on the base of bulk micromachining process and the anodic bonding between the silicon and glass. The rooting effect of the structure in deep reactive ion etching (DRIE) process was investigated. The measurement sensitivity of the accelerometer is very ideal, and the measured resonant frequency of the device is matched well with the theoretical prediction.

Keywords: Capacitive accelerometer; MEMS; Deep reactive ion etching; Slide-film damping

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