

平面S型与平面W型MEMS弹簧性能比较研究*

作者: 何光*, 石庚辰

单位: 北京理工大学机电工程与控制国家级重点实验室, 北京100081

基金项目:

摘要:

S型与W型是平面MEMS弹簧中两种典型的结构形式, 各自结构特点导致了它们具有不同的力学性能。本文通过理论分析、仿真计算和实验验证方法对平面镍质S型与平面W型MEMS弹簧性能进行了比较研究, 得出了在同样的外廓尺寸及相同的线宽、厚度和梁间距情况下, 平面S型微弹簧的刚度大于平面W型微弹簧的刚度的结论, 为MEMS弹簧的进一步优化设计提供理论参考。

关键词: 微机电系统; 平面弹簧; 刚度系数; 有限元方法

Comparative Study on Stiffness Characterization of Planar S & W-form Micro-springs Based on MEMS*

Author's Name: HE Guang*, SHI Geng-chen

Institution: National Key Laboratory of Electromechanical Engineering and Control, Beijing Institute of Technology, Beijing 100081, China

Abstract:

S-form and W-form are two kinds of typical structure of planar micro-springs based on MEMS (Micro Electro-Mechanical Systems), because of diverse form they have different mechanics features. This paper presents the study on comparative study on stiffness characterization of nickel planar S & W-form micro-springs based on MEMS by theory analysis, tensile test and ANSYS Finite Element Method. The conclusion has been drawn that the stiffness of a S-form micro-spring is stronger than that of W-form in the case of the same size of outline, feature, thickness and clearance, which is valuable for providing feasible directions to the optimization design and manufacture of the micro-spring.

Keywords: Micro Electro-Mechanical Systems (MEMS); planar spring; spring constant; finite element method (FEM)

投稿时间: 2010-03-31

[查看pdf文件](#)