

高量程加速度传感器在测试中的失效分析

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摘要:

通过在不同测试环境对高量程加速度传感器进行测试, 并对传感器在测试中出现的失效进行分析, 在实验室环境测试中出现的主要失效模式为键合引线的脱落和微梁的断裂, 其原因是不同金属的引线键合强度较低; 重复性的冲击加速了材料的疲劳。在实弹测试环境测试中出现的传感器失效原因主要是在侵彻测试中传感器芯片与侵彻信号中高频分量发生共振导致过载增大, 传感器芯片上的微结构位移失控, 造成传感器结构断裂。

关键词: 高量程加速度传感器; hopkinson杆; 侵彻; 失效

Testing of High-g MEMS accelerometer and Failure Analysis

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Abstract:

the high-g acceleration sensor is tested by different environment and analysis failure occurs in the test. The main failure modes of the micro accelerometer in shock environment are fracture of the cantilever and the wire bond shearing in a lab environment. The reason is that different metal wire bonding strength is too low; repetitive impact of accelerated material fatigue. The acceleration sensor failure is mainly due to the sensitive acceleration sensor in the penetration process and the original resonance frequency components, resulting in the displacement sensor is broken in penetration testing

Keywords: High-g accelerometer; Hopkinson bar; Penetration; Failure

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