

## 有关MEMS结构运动过程中产生和辐射电磁波的研究

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摘要：

本文对典型的MEMS结构在运动过程中产生和辐射电磁波的机理以及产生的效应进行了研究。基于对MEMS结构的机械运动过程中产生电磁波的机理。MEMS结构的相对运动以及基板上所携带电荷的运动都可以产生电磁波。在距离波源1cm处，当MEMS结构间距为1.5 $\mu\text{m}$ ，辐射出的电磁波的电场强度为0.45V/m。产生的电磁波的频率与幅度均受距离的影响。本文还考虑了辐射出的电磁波对同一个芯片上其他器件的影响。

关键词：MEMS, 电磁波, 可动结构, 静电荷

## Study on the electromagnetic wave generated and radiated by a moving MEMS structure

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**Abstract:**

Moving structures of MEMS devices can generate and radiate E-M wave. Based on the coupling physics between mechanical and electromagnetic principles to produce E-M wave have been analyzed, the movement between two MEMS electrostatic structures and the motion of charges on the substrate can generate electromagnetic wave. With the distance away from the E-M source is 1cm, the frequency is 100kHz and the gap between the MEMS structure is 1.5 $\mu\text{m}$ , the electric field strength of the radiated electromagnetic wave is 0.45V/m. The frequency and amplitude of the wave are influenced by the distance, frequency and the structure of the moving MEMS devices. The influence of the E-M wave on other devices on the same chip is also considered.

**Keywords:** MEMS, electromagnetic wave, moving structure, charges

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