

## 基于IP库的MEMS设计系统

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摘要：

针对MEMS设计系统中机械性能仿真不足、设计与加工脱节、缺少工艺验证等问题，借鉴了IC设计可重用思想，引入了具有知识产权的功能模块——IP的概念，提出了基于IP库的MEMS设计方法。该方法是Top-Down和Bottom-Up设计相结合的方法，其核心是MEMS IP库，关键技术包括IP库、虚拟工艺、虚拟运行等，分别对应IP管理、工艺级仿真系统以及器件行为级仿真系统。最后以电容式微加速度计设计为例，对双梁、四梁、疏齿等6种不同的结构分别进行了设计仿真、流水加工、封装和测试的过程，完成了器件从设计到成品的整个流程，验证了本文提出的设计方法和设计系统的有效性和正确性。

关键词：MEMS；IP库；虚拟工艺；虚拟运行

## IP Library based MEMS Design System

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**Abstract:**

A newly IP-based MEMS design methodology is proposed, which is the combination of Top-Down and Bottom-Up design. The key technology includes IP library, Virtual Operation and Virtual Process, functionally as the core reusable component management, behavior and fabrication simulators respectively. Finally, micro-accelerometers structured with double beam, four beams, and capacitance comb were designed in this MEMS design system, which were certificating the validity and correctness of the design methodology put forward in this thesis

**Keywords:** MEMS; IP; Virtual Process; Virtual Operation

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