

## 一种与CMOS工艺兼容的钨微热板

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摘要：

标准CMOS工艺中的多晶硅的热性能越来越稳定，因此多晶硅微热板受到一定的限制。本文设计了一种与标准CMOS工艺兼容的钨微热板。钨在CMOS工艺中作为通孔材料连接两层金属或者金属与硅衬底。但在钨微热板的设计过程中，钨连接一层金属，构成钨电阻，作为微热板的加热和测温电阻。测量结果显示钨的温度系数是 $0.0015/^\circ\text{C}$ ，钨微热板的热阻是 $17^\circ\text{C}/\text{mW}$ 。本文的钨微热板的设计可以应用到相关的与标准CMOS工艺兼容的热传感器的设计之中。

关键词：CMOS 工艺；MEMS；钨电阻；钨微热板

## A CMOS Compatible Tungsten Micro-hotplate

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**Abstract:**

The polysilicon micro-hotplate in the standard CMOS process is limited because the thermal property of the polysilicon is increasingly stable. This paper reports a CMOS compatible tungsten micro-hotplate. In the standard CMOS process, the tungsten has been traditionally used as a plug material to form via pathways between various metal layers and the silicon substrate. In the design of the tungsten micro-hotplate, the tungsten is used to connect one of metal layers to fabricate the tungsten resistor as the heating and temperature measurement resistor of the micro-hotplate. The measurement results show that the temperature coefficient of tungsten is about  $0.0015/^\circ\text{C}$  and the thermal impedance of the tungsten micro-hotplate is about  $17^\circ\text{C}/\text{mW}$ . The design of the tungsten micro-hotplate can be applied to other thermal-based sensors in the standard CMOS process.

**Keywords:** CMOS technology; MEMS; tungsten resistor; tungsten micro-hotplate;

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