Design and Fabrication of Flexible Micro Sensors

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ABSTRACT

The purpose of this paper is to apply Surface Micromachining of MEMS techniques to manufacture a micro flexible sensor. Micro sensors not only have a smaller physical size than their traditional counterparts, but also provide a greater measurement accuracy and a higher sensitivity. MEMS components integrate with measured circuit or devices and miniature dimension is easier to get well to be conveniently portable. In this study, a platinum layer is deposited to form resistors and a Au layer is deposited on the resistors to serve as an electrode and to provide electrical leads, which are sandwiched between two polyimide layers as flexible substrates. Then we manufacture a bottom plate of PDMS which be broached five different diameters of holes. When we apply a weight on the pressure sensor placed on the PDMS, bottom plate we can measure the resistance variation to determine the pressure. The experimental data indicate that sensitivity increases as the diameters of holes of PDMS plates. Not only the measured resistance value increases as the temperature increases, the sensitivity of the temperature increases as the bending curvature decreases. Therefore it is easy to measure pressure and temperature by the simplified structure.

Keywords : MEMS、polyimide、pressure sensor、PDMS、temperature sensor

Table of Contents

封面內頁 簽名頁 授權書.. iii 中文摘要...................................... iv 英文摘要.. v 誌謝... vi 目錄... vii 圖目錄... ix 表目錄... xi 符號說明................................... xii 第一章　諸論 1.1 前言....................................... 1 1.2 微機電系統.................................. 2 1.2.1 元件與應用................................ 3 1. 3 可撓式感測器之介紹..........................4 1.3.1 壓力感測器之基本特性....................... 5 1.3.2 溫度感測器之基本特性...................... 6 1.4 可撓式感測器研究動機與目的.................. 7 1.5 文獻回顧.................................... 8 第二章　可撓式壓力感測器理論與設計 2.1 可撓式壓力感測器原理....................... 11 2.2 可撓式壓力感測器之尺寸設計................. 13 2.3 下板不同開孔孔徑尺寸大小之設計............. 13 第三章 可撓式陣列溫度感測器理論與設計 3.1 可撓式陣列溫度感測器原理................... 15 3.2 可撓式陣列溫度感測器之尺寸設計............. 17 第四章 薄膜結構製作與製程處理 4.1 簡介....................................... 18 4.2相關製程技術簡介............................ 18 4.2.1 晶片清潔................................ 18 4.2.2 微影製程................................ 20 4.2.3 蒸鍍技術................................. 24 4.2.4 金屬層剝離(Lift-off)..................... 25 4.2.5 蝕刻.................................... 26 4.2.6 聚醯亞胺之薄膜技術....................... 27 4.3 感測器製程介紹............................. 29 4.3.1 晶圓選擇與準備........................... 30 4.3.2 蒸鍍犧牲層............................... 30 4.3.3 製作下保護層之薄膜....................... 30 4.3.4 定義白金感測電阻圖案..................... 31 4.3.5 定義金電極圖案........................... 32 4.3.6 製作上保護層之薄膜....................... 32 4.3.7 蝕刻.................................... 32 4.3.8 PDMS製程................................ 33 4.4 製程儀器使用技術........................... 33 4.4.1 物理氣相沉積技術......................... 33 4.4.2 膠膜機................................... 35 4.4.3 對準曝光機.............................. 35 4.4.4 真空烘箱............................... 37 4.5 製程與討論................................. 37 第五章 實驗結果與討論 5.1 實驗數據討論............................... 39 5.2 可撓式壓力感測器量測結果................... 39 5.2.1 感測器電阻值對壓力的變化................. 39 5.2.2 不同孔徑大小對電阻值變化................. 40 5.3 可撓是溫度感測器量測結果................... 40 5.3.1 感測器電阻值對溫度的變化................. 40 5.3.2不同曲度對電阻值變化....................... 41 第六章 結論與未來展望 6.1 結論...................................... 42 6.2 未來展望................................... 43 參考文獻.. 44

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