

Piezoelectric Energy Harvesting and Storage System

陳永翰、鄭江河

E-mail: 364866@mail.dyu.edu.tw

ABSTRACT

Nowadays, due to the energy shortages, people begin to find new energy sources to replace the existing ones. The ways of collecting energy sources in the environment play an important role in human life where many kinds of vibration energy exist. This green energy will gradually replace the traditional energy such as fossil energy, etc. Piezoelectric materials, which have the function of electromechanical energy conversion, can be applied to converting vibration energy into electrical energy. In this study, we have proposed a piezoelectric energy harvester, which is made of MEMS technology, can capture energy from airflow-induced vibration. It converts airflow energy into electrical energy by the piezoelectric conversion effect of the oscillation of PZT wafer. Besides, we also discuss the output electrical energy caused by the controlling factors in this article. The possibility that the electrical energy can be stored in the capacitor after rectification is verified finally. Experimental results show that the harvesting device produces an output power of about $13.07 \mu W$ when the excitation pressure oscillates with an amplitude of 2.0kPa and a frequency of about 52.4Hz.

Keywords : piezoelectric energy harvesting、energy storage system

Table of Contents

封面內頁 簽名頁 中文摘要.....	iii	英文摘要.....	iv	誌謝.....	v	目錄.....	vi	圖目錄.....	ix	表目錄.....	xiii
符號說明.....	xiv	第一章 緒論.....	1	1.1 前言.....	1	1.2 研究動機.....	2	1.3 文獻回顧.....	3	第二章 壓電能量擷取器之設計與分析.....	10
2.1 壓電原理.....	10	2.1.1 壓電材料.....	10	2.1.2 壓電陶瓷.....	11	2.1.3 壓電效應.....	13	2.2 壓電能量擷取器結構設計.....	15	2.2.1 設計概念.....	15
2.2.2 作動原理.....	18	第三章 壓電能量擷取器結構元件製作.....	20	3.1 黃光製程.....	20	3.2 蝕刻製程.....	22	3.3 元件製作.....	23	3.4 壓電換能器之製作.....	25
3.5 壓電能量擷取器之組裝.....	28	第四章 實驗設備與架設.....	30	4.1 共振頻率量測.....	30	4.2 輸入壓電能量擷取器之壓力量測.....	33	4.3 壓力源對壓電能量擷取器輸出之關聯.....	34	第五章 實驗結果與討論.....	37
5.1 變壓量測各模組電壓輸出.....	37	5.1.1 改變振動板厚度為操作變因量測.....	37	5.1.2 改變PZT直徑為操作變因量測.....	37	5.2 變壓量測各模組電流輸出.....	41	5.2.1 改變振動板厚度為操作變因量測.....	41	5.2.2 改變PZT直徑為操作變因量測.....	41
5.3 壓電電能對超級電容充電測試.....	43	5.3.1 經整流後之輸出電功率量測.....	45	5.3.2 電容充電過程量測.....	47	5.4 壓電電能對鎳氫充電電池充電測試.....	50	第六章 結論與展望.....	53	6.1 結論.....	53
6.2 未來展望.....	54	參考文獻.....	55								

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