

課題番号 : F-19-UT-0015
 利用形態 : 機器利用
 利用課題名(日本語) :
 Program Title (English) : Rotational Electret Energy Harvester with Self-powered SSHI
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 キーワード/Keyword : リソグラフィ・露光・描画装置, エネルギー関連技術, Energy Harvester

1. 概要(Summary)

A dual-stage electrode design has been presented for electret-based rotational energy harvester (EH) to improve efficiency of synchronized switch harvesting on inductor (SSHI) technique. With the aid of the present parallel SSHI circuit, output power of the rotational electret EH developed in our group becomes 4.2 times higher if compared with the conventional full-bridge rectifier.

2. 実験(Experimental)

【利用した主な装置】

超高速大面積電子線描画装置

【実験方法】

A photo mask of a novel dual-stage design is fabricated and developed using the device above. A dual-stage electrode is then fabricated.

3. 結果と考察(Results and Discussion)

Figure 1 shows the fabricated dual-stage electrode as the stator of the rotational electret energy harvester.

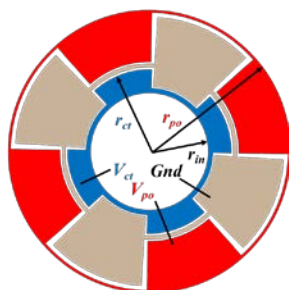


Fig. 1 Radius-based dual-stage electrode for rotational electret energy harvester.

Thanks to the dual-stage design, the power harvested by the rotational electret energy harvester is increased by 300% if compared with conventional full-bridge rectifier (Fig. 2).

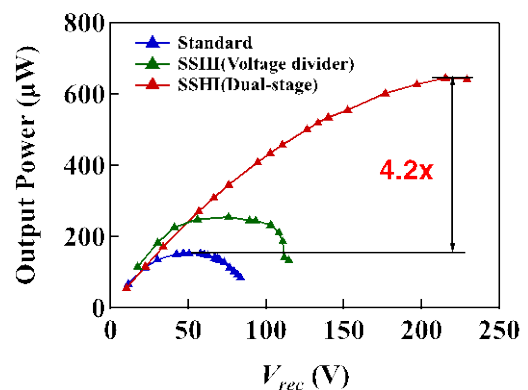


Fig. 2 Measured harvested power as a function of rectified voltage.

4. その他・特記事項(Others)

- 共同研究者: Prof. Adrien Badel, SYMME Laboratory, Université Savoie Mont Blanc, France
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5. 論文・学会発表(Publication/Presentation)

Liu, Y., Badel, A., and Suzuki, Y.,
 "Dual-stage Electrode Design of Rotational Electret Energy Harvester for Efficient Self-powered SSHI,"
 J. Phys.: Conf. Ser., Vol. 1407, 012017 (2019).

6. 関連特許(Patent)

なし。