Master's Thesis
석 사 학 위 논 문

An Antiphase-synchronized Dual Ring Oscillator Based Capacitive Voltage Doubler with Power Optimizable Feedback Loop

Yeonjae Shin (신 연 재 申 娟 才)

Department of Information and Communication Engineering

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Advisor : Professor Junghyup Lee
Co-Advisor: Professor Jaeha Kung

by

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A thesis submitted to the faculty of DGIST in partial fulfillment of the requirements for the degree of Master of Science in the Department of Information and Communication Engineering. The study was conducted in accordance with Code of Research Ethics[1)].

November 30, 2020

Approved by

Professor (Advisor)	Junghyup Lee	(signature)
Professor (Co-Advisor)	Jaeha Kung	(signature)

[1] Declaration of Ethical Conduct in Research: I, as a graduate student of DGIST, hereby declare that I have not committed any acts that may damage the credibility of my research. These include, but are not limited to: falsification, thesis written by some-one else, distortion of research findings or plagiarism. I affirm that my thesis contains honest conclusions based on my own careful research under the guidance of my thesis advisor.

An Antiphase-synchronized Dual Ring Oscillator Based Capacitive Voltage Doubler with Power Optimizable Feedback Loop

Yeonjae Shin

Accepted in partial fulfillment of the requirements for
the degree of Master of Science.

(May 23, 2020)

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Abstract

abstract will be here

Keywords: keyword will be here, here2, here3

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I. Introduction

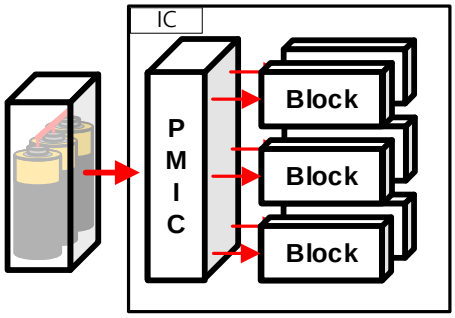

Figure I.1: The fully-integrated chip with external power source

Battery is one of the biggest part of IoT(Internet of Things) devices. Thus, managing the power within limited source is the key aspect of make fully integrated system smaller which is desirable for IoT. the aim of all PMICs(Power Management Integrated Circuit) is make clear and precise voltage or current we need. Moreover,PMIC itself, should efficient as possible so that it runs like there is not any burden without the core blocks themselves.

II. Chapter 3

reference Test1[1] and reference Test2[2] also reference Test3[3]

2.1 Section3.1

2.1.1 Subsection3.1.1

$$M_{ba} = \frac{\phi_{ba}(I_a)}{I_a} = \oint_{A_b} \frac{B_b(I_a)}{I_a} dA_b. \tag{II.1}$$

Figure II.1: Figure test

table II.1: Table test

Medium	Permittivity	Conductivity (simens/m)	Loss tangent	Thickness (mm)
Skin (dry)	285.25	0.24	1.11	1.97
Fat	11.82	0.03	3.40	5.00
Muscle	138.44	0.63	6.02	30

III. Conclusions and future work

3.1 Conclusions

3.2 Future work

References

[1] L. Shi, Z. Kabelac, D. Katabi, and D. Perreault, "Wireless power hotspot that charges all of your devices," in *Proceedings of the 21st Annual International Conference on Mobile Computing and Networking*. ACM, Sept. Sept. 2015, pp. 2–13.

[2] S. Kisseleff, I. F. Akyildiz, and W. Gerstacker, "Beamforming for magnetic induction based wireless power transfer systems with multiple receivers," in *2015 IEEE Global Communications Conference (GLOBECOM)*, Dec. 2015, pp. 1–7.

[3] M. Zhou, M. R. Yuce, and W. Liu, "A non-coherent dpsk data receiver with interference cancellation for dual-band transcutaneous telemetries," *IEEE Journal of Solid-State Circuits*, vol. 43, no. 9, pp. 2003–2012, Sept. 2008.

요 약 문

국문제목

이 논문에서는 부 쓰는이가 여러 안테나를 쓰는 협력 인지 무선통신망을 다루었다. 안테나 개수는 이제까지의 방법과 같도록 유지하면서 부 쓰는이가 다다를 수 있는 전송률을 높이는 방안을 제시하였다. 좀 더 자세히 말하면, 동시 송수신 안테나를 써서 부 쓰는이끼리 전 이중으로 신호를 주고받을 수 있게 하여 부 쓰는이가 다다를 수 있는 전송률을 높이는 방안을 제시하고 그 성능을 살펴보았다. 제안한 협력 인지 무선통신망이 나타내는 다다를 수 있는 전송률이 이제까지의 다른 협력 인지 무선통신망에서 얻을 수 있는 것과 견주어 꽤 높음을 해석적인 방법과 계산적인 방법으로 보였다.

핵심어: 핵심어1, 핵심어2, 핵심어3, 핵심어4, 핵심어5