

JONGBEOM BAEK

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EDUCATION

University of California, Berkeley

CA, USA

- Ph.D. in Electrical Engineering

Aug. 2021 - Present

Korea Advanced Institute of Science and Technology (KAIST)

Daejeon, Korea

- M.S. in Electrical Engineering
- Academic Advisor: Prof. Gyu-Hyeong Cho

Mar. 2014 - Feb. 2016

Sogang University

Seoul, Korea

- B.S. in Electrical Engineering

Mar. 2008 - Feb. 2014

Working Experiences

Staff engineer, Samsung Electronics Inc., Mixed-Signal Core Design Team

Mar. 2016 - Present

- Designed LDOs, buck converter in 28nm CMOS process for IoT application
- Designed buck-boost converter in 90nm and 130nm CMOS processes
- Designed hybrid buck-boost converter in 90nm CMOS process
- Commercialization of hybrid supply modulator for an envelope tracking RF-PA

Internship, Samsung Electronics Inc., Power IC development Team

Jul. 2015 - Aug. 2015

Military Service at Republic of Korea (R.O.K.) Army

Apr. 2009 - Feb. 2011

Publications

1. Ji-Seon Paek, Dongsu Kim, Jae-Yeol Han, Younghwan Choo, Jun-Suk Bang, Seungchan Park, **Jongbeom Baek**, Takahiro Nomiya, Ik-Hwan Kim, Jongwoo Lee "Efficient RF-PA Two-Chip Supply Modulator Architecture for 4G LTE and 5G NR Dual-Connectivity RF Front End"
2022 IEEE Journal of Solid-State Circuits (JSSC)

2. Jun-Suk Bang, Dongsu Kim, Jeongkwang Lee, Sungyoub Jung, Younghwan Choo, Seungchan Park, Young-Ho Jung, Jae-Young Ko, Takahiro Nomiya, **Jongbeom Baek**, Jaeyeol Han, Sang-Han Lee, Ik-Hwan Kim, Ji-Seon Paek, Jongwoo Lee, Thomas Byunghak Cho "2-Tx Digital Envelope-Tracking Supply Modulator Achieving 200MHz Channel Bandwidth and 93.6% Efficiency for 2G/3G/LTE/NR RF Power Amplifiers"

2022 IEEE International Solid-State Circuits Conference (ISSCC)

3. Dongsu Kim, Jun-Suk Bang, **Jongbeom Baek**, Takahiro Nomiya, Seungchan Park, Young-ho Jung, Jaeyeol Han, Yumi Lee, Ik-Hwan Kim, Ji-Seon Paek, Jongwoo Lee, Thomas Byunghak Cho "A Hybrid Switching Supply Modulator Achieving 130MHz Envelope Tracking Bandwidth and 10W Output Power for 2G/3G/LTE/NR RF Power Amplifiers"

2021 IEEE International Solid-State Circuits Conference (ISSCC)

4. **Jongbeom Baek**, Takahiro Nomiya, Seungchan Park, Young-ho Jung, Dongsu Kim, Jaeyeol Han, Jun-Suk Bang, Yumi Lee, Ik-Hwan Kim, Ji-Seon Paek, Jongwoo Lee, Thomas Byunghak Cho "A Voltage-Tolerant Three-Level Buck-Boost DC-DC Converter with Continuous Transfer Current and Flying Capacitor Soft Charger Achieving 96.8% Power Efficiency and 0.87 μ s/V DVS Rate"

2020 IEEE International Solid-State Circuits Conference (ISSCC)

5. **Jongbeom Baek**, Hyung-Min Lee, and Se-Un Shin "Triple-Mode Switched-Inductor-Capacitor DC-DC Buck Converter with Reusable Flying Capacitor and Bang-Bang Zero-Current Detector for Wide Load Current Range", **MDPI electronics**, vol. 9, no. 8, pp. 1202, July **2020**.

6. Ji-Seon Paek, Dongsu Kim, Jun-Suk Bang, **Jongbeom Baek**, Jeonghyun Choi, Takahiro Nomiya, Jaeyeol Han, Younghwan Choo, Yongsik Youn, Euiyoung Park, Sungjun Lee, Ik-Hwan Kim, Jongwoo Lee, Thomas Byunghak Cho, Inyup Kang "An 88%-Efficiency Supply Modulator Achieving 1.08 μ s/V Fast Transition and 100MHz Envelope-Tracking Bandwidth for 5G New Radio RF Power Amplifier"

2019 IEEE International Solid-State Circuits Conference (ISSCC)

7. **Jongbeom Baek**, Ji-Hun Lee, Se-Un Shin, Min-yong Jung, Gyu-Hyeong Cho "Switched inductor capacitor buck converter with >85% power efficiency in 100 μ A-to-300mA loads using a bang-bang zero-current detector"

2018 IEEE Custom Integrated Circuits Conference (CICC)

8. Takahiro Nomiya, Yongsik Youn, Younghwan Choo, Dongsu Kim, Jaeyeol Han, Junhee Jung, **Jongbeom Baek**, Sungjun Lee, Euiyoung Park, Jeonghyun Choi, Ji-Seon Paek, Jongwoo Lee, Thomas Byunghak Cho, Inyup Kang "A 2TX supply modulator for envelope-tracking power amplifier supporting intra- and inter-band uplink carrier aggregation and power class-2 high-power user equipment"

2018 IEEE International Solid-State Circuits Conference (ISSCC)

9. Ji-Hun Lee, Jun-Suk Bang, Ki-Duk Kim, Hui-Dong Gwon, Sang-Hui Park, Yeunhee Huh, Kye-Seok Yoon, **Jong-Beom Baek**, Yong-Min Ju, Gibbeum Lee, Homin Park, Hyeon-Min Bae, Gyu-Hyeong Cho "An 8 Ω 10W 91%-power-efficiency 0.0023%-THD+N multi-level Class-D audio amplifier with folded PWM"

2017 IEEE International Solid-State Circuits Conference (ISSCC)

10. Se-Un Shin, Min-Yong Jung, Ki-Duk Kim, Sang-Hui Park, Yeunhee Huh, Changsik Shin, Se-hong Park, Jun-Suk Bang, **Jong-Beom Baek**, Sung-Won Choi, Yong-Min Ju, Gyu-Hyeong Cho “A reconfigurable SIMO system with 10-output dual-bus DC-DC converter using the load balancing function in group allocator for diversified load condition”

2016 IEEE Symposium on VLSI Circuits (VLSI-Circuits)

Patents

1. Switching regulator generating continuous output delivery current and operating method thereof. (US11258359)
2. Switching regulator for dynamically changing output voltage and power supply circuit including the switching regulator. (US10879804)
3. Switching regulator and method of operating the same. (US10985654)
4. Inverting switching regulator using charge pump and operating method thereof. (US11251708)
5. Apparatus and method for charging current control. (Application number. P20200064123. US)
6. Single inductor multiple output buck boost converter. (Application number. P20210158838. US)

RESEARCH INTERESTS

- Supply modulator for envelope tracking (ET) power amplifier
- Analog integrated circuit design
- Mixed-signal integrated circuit design
- Inductive switching DC-DC converter
- Switched capacitor DC-DC converter, Hybrid DC-DC converter
- Low drop-out regulator
- Radio Frequency integrated circuit design

Honors and Awards

National Scholarship for Science and Engineering, Korea Science Foundation, Korea
Mar. 2012 - Feb. 2014

- Full tuition scholarship for academic excellence

EPSS Scholarship, Samsung Electronics Inc., Korea
Mar. 2014 - Feb. 2016

- Full tuition scholarship for academic excellence

Early promotion as a staff engineer, Samsung Electronics Inc., Korea
Mar. 2020 -

- 2 years early promotion

Recipient of Ph.D. fellowship, Samsung Electronics Inc., Korea
Sep. 2021 -

- Award guaranteed: full financial support for Ph.D.

COMPUTER SKILLS

- Cadence Spectre & Virtuoso, Mentor Calibre
- Synopsis HSPICE & FineSim
- SIMetrix/SIMPLIS, PSIM
- Verilog-A
- MATLAB, C programming, Python