

Joon-Hyung Kim



M.S. & PH.D. CANDIDATE, SCD LAB IN CHUNGNAM NATIONAL UNIVERSITY
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Education

Chungnam National University

M.S. & PH.D. CANDIDATE IN DEPARTMENT OF ELECTRONICS ENGINEERING
THESIS: FR3 / D-BAND PHASED ARRAY TRANSCEIVER FOR RADAR AND COMMUNICATION
ADVISOR: PROF. CHOUL-YOUNG KIM

Daejeon, Korea
Mar. 2022 – Present

Chungnam National University

B.S. IN DEPARTMENT OF ELECTRONICS ENGINEERING
ADVISOR: PROF. CHOUL-YOUNG KIM

Daejeon, Korea
Mar. 2016 – Feb. 2022

Research Interest & Skills

Interests	mm-wave Integrated Circuits Design (CMOS, CMOS SOI, BiCMOS, GaAs, GaN) Beam-former Transceiver for Communication and Radar Power Amplifier, Low Noise Amplifier, Phase Shifter, Up/Down Conversion Mixer, EBD
SW	Cadence, ADS, Sonnet, Momentum
HW	Network Analyzer, Signal Analyzer, Signal Generator, Noise Analyzer, Up & Down Converter (mm-Wave Extension Module), Probe Station

International Journal

Ultralow Noise Figure and Broadband CMOS LNA With Three-Winding Transformer and Large Transistor

Joon-Hyung Kim, Jeong-Taek Son, Jeong-Taek Lim, Han-Woong Choi, Choul-Young Kim
IEEE Transactions on Microwave Theory and Techniques (TMTT)

2024

Compact Dual-Core Drive Stage using Three-winding Transformer for CMOS Broadband Power Amplifier (invited paper)

Joon-Hyung Kim, Jeong-Taek Son, Jae-Hyeok Song, Jae-Eun Lee, Min-Seok Baek, Jeong-Taek Lim, Han-Woong Choi, Seong-Mo Moon, Dongpil Chang, Choul-Young Kim
IEEE Microwave and Wireless Technology Letters (MWTL)

2024

180° Switching-Method based on Transformer for CMOS Phase Shifter

Joon-Hyung Kim, Han-Woong Choi, Min-Seok Baek, Choul-Young Kim
IEEE Microwave and Wireless Technology Letters (MWTL)

2024

A Low-Power High-IP 1dB Low-Noise Amplifier Using Large-Transistor and Class-AB Mode

Min-Seok Baek, Han-Woong Choi, **Joon-Hyung Kim**, Jae-Hyeok Song, Jae-Eun Lee, Jeong-Taek Son, Choul-Young Kim
IEEE Microwave and Wireless Technology Letters (MWTL)

2024

Low Insertion Loss CMOS Phase Shifter for Wireless Power Transfer System

Jeong-Taek Lim, Jae-Hyeok Song, **Joon-Hyung Kim**, Min-Seok Baek, Changkun Park, Choul-Young Kim
IEEE Microwave and Wireless Technology Letters (MWTL)

2024

A Sub-6 GHz Asymmetric GaAs SPDT Switch With High Tx to Rx Isolation and Low Insertion Loss

Jae-Eun Lee, Jae-Hyeok Song, Min-Seok Baek, Jeong-Taek Son, **Joon-Hyung Kim**, Eun-Gyu Lee, Sunkyu Choi, Choul-Young Kim
IEEE Microwave and Wireless Technology Letters (MWTL)

2024

A 37–40 GHz 6-Bits Switched-Filter Phase Shifter Using 150 nm GaN HEMT

Jae-Hyeok Song, Eun-Gyu Lee, Jae-Eun Lee, Jeong-Taek Son, **Joon-Hyung Kim**, Min-Seok Baek, Choul-Young Kim
Nanomaterials

2023

International Conference

An Efficient Ku-Band Two-Way Vertical-like Power-Combining Power Amplifier using Merged Inter-stage Transformers Achieving 23-23.4 dBm Psat and 45.2-46.6% Peak PAE in 65nm CMOS

Joon-Hyung Kim, Jeong-Taek Lim, Jae-Eun Lee, Jae-Hyeok Song, Jeong-Taek Son, Min-Seok Baek, Eun-Gyu Lee, Sunkyu Choi, Han-Woong Choi, Seong-Mo Moon, Dongpil Chang, Choul-Young Kim
2024 IEEE Radio Frequency Integrated Circuits Symposium (RFIC)

2024

Compact Dual-Core Drive Stage using Three-winding Transformer for CMOS Broadband Power Amplifier

Joon-Hyung Kim, Jeong-Taek Son, Jae-Hyeok Song, Jae-Eun Lee, Min-Seok Baek, Jeong-Taek Lim, Han-Woong Choi, Seong-Mo Moon, Dongpil Chang, Choul-Young Kim
2024 IEEE MTT-S International Microwave Symposium (IMS)

2024

High-Performance Broadband CMOS Low-Noise Amplifier with a Three-Winding Transformer for Broadband Matching

Joon-Hyung Kim, Jeong-Taek Son, Jeong-Taek Lim, Jae-Eun Lee, Jae-Hyeok Song, Min-Seok Baek, Han-Woong Choi, Eun-Gyu Lee, Sunkyu Choi, Chong-Min Lee, Sung-Ku Yeo, Choul-Young Kim
2023 IEEE Radio Frequency Integrated Circuits Symposium (RFIC)

2023

Patents

Balun transformer for amplifier and amplifier including same(10-2023-0123701)

증폭기용 발룬 트랜스포머 및 이를 포함하는 증폭기
Joon-Hyung Kim, Choul-Young Kim

Korea
2023

Amplifier with linearizer for second harmonic suppression (10-2023-0173784)

2차 고조파 억제를 위한 선형화기를 갖는 증폭기
Joon-Hyung Kim, Min-Seok Baek, Choul-Young Kim

Korea
2023

Two-way Power Amplifier Design Technique for Cost Reduction & Power Amplification (PCT/KR2023/017070) Joon-Hyung Kim, Choul-Young Kim	International 2023
Technique for Enhancing Noise Figure and Bandwidth in Low Noise Amplifier (PCT/KR2023/010236) Joon-Hyung Kim, Choul-Young Kim	International 2023
Power amplifier, amplifier transformer and driving amplifier (10-2023-0098424) 전력증폭기, 증폭기용 트랜스포머 및 구동증폭기 Joon-Hyung Kim, Sunkyu Choi, Choul-Young Kim	Korea 2023
180° phase shifter using polarity maintaining transformer (10-2023-0146338) 극성 유지 변압기를 이용한 180° 위상 천이기 Jae-Hyeok Song, Jeong-Taek Lim, Joon-Hyung Kim, Choul-Young Kim	Korea 2023
Bridge capacitor attenuator for phase balancing (10-2023-0187911) 위상 균형 조절을 위한 브릿지 커패시터 감쇠기 Min-Seok Baek, Joon-Hyung Kim, Choul-Young Kim	Korea 2023
Amplifier (10-2022-0188179) 증폭기 Joon-Hyung Kim, Han-Woong Choi, Jeong-Taek Lim, Choul-Young Kim	Korea 2022
Power Divider/Combiner (10-2022-0070440) 전력 분배기/결합기 Joon-Hyung Kim, Jae-Hyeok Song, Choul-Young Kim	Korea 2022

Research Experience

Development of millimeter-level ultra-compact radar-communication system PARTICIPANT	Institute for Information & communication Technology Planning & evaluation (IITP) Jul. 2024 – Present
Development of D-band low-loss material and Modularization technology on beamforming with high performance PARTICIPANT	Korea Planning & Evaluation Institute of Industrial Technology (KEIT) Jul. 2024 – Present
Developments of mmWave Single Antenna Dual Polarization Full-Duplex Radar-Communication Transceiver CMOS Integrated Circuits PARTICIPANT	National Research Foundation of Korea Jul. 2024 – Present
Transmitter/Receiver RFIC component design research for satellite communication PARTICIPANT	Institute for Information & communication Technology Planning & evaluation (IITP) Mar. 2022 – Present

Development and commercialization of high-resolution 77GHz FMCW imaging radar module for autonomous vehicles PARTICIPANT	Korea Technology & Information Promotion Agency for SMEs <i>Apr. 2023 – Present</i>
Developments of mm-wave Single Antenna Wideband Full-Duplex Beamforming Transceiver CMOS Integrated Circuits PARTICIPANT	National Research Foundation of Korea <i>Mar. 2022 – Feb. 2024</i>
Terahertz Wireless System for Cooperative Intelligent Edge (TWICE) Laboratory PARTICIPANT	National Research Foundation of Korea <i>Mar. 2022 – Feb. 2024</i>
A Development of W-band Chirp Radar RFIC for Level Sensor PARTICIPANT	Institute for Information & communication Technology Planning & evaluation (IITP) <i>Mar. 2022 – Dec. 2023</i>
Development of Transceiver FEM IC for Ku Band Beamforming Antenna PARTICIPANT	Korea Institute for Advancement of Technology <i>Jun. 2022 – Aug. 2023</i>

Awards & Honors

RFIC2024 Showcase Selected Title: An Efficient Ku-Band Two-Way Vertical-like Power-Combining Power Amplifier using Merged Inter-stage Transformers Achieving 23-23.4 dBm Psat and 45.2-46.6% Peak PAE in 65nm CMOS Joon-Hyung Kim , Jeong-Taek Lim, Jae-Eun Lee, Jae-Hyeok Song, Jeong-Taek Son, Min-Seok Baek, Eun-Gyu Lee, Sunkyu Choi, Han-Woong Choi, Seong-Mo Moon, Dongpil Chang, Choul-Young Kim 2024 IEEE Radio Frequency Integrated Circuits Symposium (RFIC)	2024
IMS2024 Top 50 Paper Selected Title: Compact Dual-Core Drive Stage using Three-winding Transformer for CMOS Broadband Power Amplifier Joon-Hyung Kim , Jeong-Taek Son, Jae-Hyeok Song, Jae-Eun Lee, Min-Seok Baek, Jeong-Taek Lim, Han-Woong Choi, Seong-Mo Moon, Dongpil Chang, Choul-Young Kim 2024 IEEE MTT-S International Microwave Symposium (IMS)	2024
RFIC2023 Popular Paper *: International Top-4 & Domestic Top-1 Title: High-Performance Broadband CMOS Low-Noise Amplifier with a Three-Winding Transformer for Broadband Matching 2023 IEEE Radio Frequency Integrated Circuits Symposium (RFIC) *: As of Jan. 2024	2024
BK21 Scholarship Ministry of Education, Republic of Korea	2022 – Current
Best Paper Award Title: FR3 Band Broadband Linear Power Amplifier supporting 64-/256-QAM Modulations for LEO SATCOM Joon-Hyung Kim , Jae-Eun Lee, Jong-Seong Park and Choul-Young Kim IEEE Daejeon Section, The Institute of Electronics and Information Engineers, Republic of Korea	2023

Best Paper Award

Title: CMOS High-Linear Power Amplifier Design for 802.11ac 5GHz Wi-Fi
Jae-Hyeok Song, Jeong-Taek Lim, Jae-Eun Lee, Jeong-Taek Son, **Joon-Hyung Kim**, Min-Seok Baek, Eun-Gyu Lee, Sun-Gyu Choi, and Choul-Young Kim
IEEE Daejeon Section, The Institute of Electronics and Information Engineers, Republic of Korea

2023

Outstanding Research Award

Chungnam National University, Republic of Korea

2023

Outstanding Research Award

Chungnam National University, Republic of Korea

2022

The Top Prize

CNU Engineering Fair, Chungnam National University, Republic of Korea

2021