DO QUANG HUY

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EDUCATION

Kyung Hee University — Yongin, South Korea
Ph.D. in Electronic Engineering. — *Spring 2021 – Spring 2026*
Advisor: Prof. Yoon Sang Woong.
Thesis: High Isolation Phase Conjugator and Wideband CMOS Circulator IC for Retrodirective Wireless Power Transfer System.
GPA: 4.0/4.3

Hanoi University of Science and Technology — Hanoi, Vietnam
B.E. in Mechatronics Engineering. — *Fall 2015 – Fall 2020*
Advisor: Prof. Vu Toan Thang.
Thesis: Design of an Automatic Balancing System for a Lift-Assist Manipulator.
GPA: 3.2/4.0

SKILLS SUMMARY

- **Technical** : RF/Analog Design, IC Layout, EM Simulation, PCB Design.
- **CAD Tools** : Cadence, Calibre, SpectreRF, ADS, HFSS, SiWave, Altium
- **Programming** : C/C#/C++, Python, Shell.
- **Lab Skills** : Spectrum/Network Analyzer, Signal Generator, Probe Station, Noise Analyzer, Laser Trimming.
- **Soft Skills** : People Management, Scientific Writing, Collaboration.
- **Language** : IELTS 7.0.

WORK EXPERIENCE

Graduate Researcher | Kyung Hee University — Yongin, South Korea
(Full Time) — *2021.03 – present*

RF/Analog IC Design & Tape-Out:

- Design RF/Analog front-end circuits (LNAs, DAs, Mixers, VCOs, Circulators…) and contribute to system architecture for intelligent wireless power transfer.
- Perform schematic design, simulation, layout, and full verification flow (DRC, LVS, PEX).
- Conduct EM simulations (HFSS, Siwave) for on-chip passives and RF structures and prepar design DB for tape-out.

Prototyping, PCB & Testing:

- Develop test plans, design PCB test benches, perform functional, RF, and system-level measurements.

- Experience with lab equipments: VNAs, Spectrum Snalyzers, Oscilloscopes, Signal Generators, Probe Stations, Laser Trimming.
- Debug and optimize designs based on measurement results.

Documentation & Publication:

- Write and contribute to project proposals and research reports.
- Prepare scientific manuscripts, conference papers, and presentations.
- Generate and maintain design documentation including schematics, specs, measurement logs, and test reports.

Collaboration & Mentoring:

- Mentor undergraduate and graduate students in RFIC design, measurement techniques, and Cadence workflow.

Hardware Engineer | VIETMANI JSC Hanoi, Vietnam
(Full Time) *2018.04 – 2019.08*

Control & Embedded Systems:

- Design feedback-control system for lift-assisted manipulator.
- Microcontroller programming (AVR, ARM).

Mechanical & Structural Design:

- 3D modeling and assembly (Inventor, NX, AutoCAD).
- FEA simulation for force, stress, and bending analysis.

Prototyping & Testing:

- Design control board, integrate with prototype manipulator.
- Calibration of sensors and actuators.

Documentation & Collaboration:

- Create schematics, wiring diagrams.
- Write manuals, test reports, and design documentation.

Hardware Engineer | BKAPEMA Co. Ltd. Hanoi, Vietnam
(Intern) *2018.04 – 2019.08*

Control & Automation Systems:

- PLC programming (Siemens, Mitsubishi, Delta).
- HMI design for machine control and monitoring.

Electrical System & Sensor Integration:

- Integration of sensors (proximity, pressure, temperature, limit sensors).
- Relay control, contactors, starters, and circuit protection devices.
- Motor and actuator control using Raspberry Pi (DC, BLDC, servo, pneumatic/hydraulic).

Documentation & Collaboration:

- Create wiring diagrams, I/O lists, and control flow documentation.
- User manuals and operation guides for HMI/PLC systems.
- Collaboration with mechanical teams to ensure system compatibility.

Hardware Engineer | SELEX MOTORS JSC Hanoi, Vietnam
(Intern) *2017.06 – 2018.12*

Electronics Circuit & PCB Design:

- Schematic design of Battery Management System (BMS) incorporating MCUs, power management circuitry, opto-electrical components, sensors, and analog/mixed-signal components under supervision.

Prototyping & Testing:

- Participate in the development and execution of test plans, building and validating BMS prototype.

Cross-Team Collaboration:

- Work with Mechanical Team for electronics-mechanics integration (connector placement, mechanical constraints).
- Work with Embedded Team to define hardware–firmware interfaces.

Component Selection & BOM Management:

- Evaluate and select components based on availability, cost, and lifecycle.
- Create and maintain Bill of Materials (BOM).

PROJECTS

IR Receiver Based on Staggered Communication *2025.05 – present*

Main Reseacher

- Studied staggered commutation techniques for intrinsic image rejection without conventional quadrature mixing.
- Designed and simulated a prototype receiver to evaluate conversion gain, image suppression, noise and linearity performance.

High Isolation Phase Conjugator and Wideband Circulator IC for Retrodirective Wireless Power Transfer System *2023.03 – 2025.03*

Main Reseacher

- Proposed self-interference cancellation (SIC) technique to enhance retro-directivity in wireless power transfer.
- Designed a phase conjugator by integrating SIC with a Gilbert-cell mixer.
- Studied configurations of N-path commutated network-based circulator to improve TX-RX isolation and transmisison performance.
- Proposed a novel use of non-Foster elements to widen isolation bandwidth.
- Designed a 2.4 GHz magnetic-free circulator.
- Tape-out completed with Samsung 28nm RF CMOS.
- Phase-conjugator's measurement showed state-of-the-art isolation performance, and fabricated circulator achieved 25% factional banwidth.

Retro-directive RF SoC with Magnetic-free Circulator *2022.01 – 2023.01*

Main Reseacher

- Conducted research on magnetic-free circulator for integration in full-duplex communication.
- Designed a fully integrated CMOS circulator including N-path filter-based gyrator and 4-phase clock generator.
- Proposed a negative capacitor (NCAP) delay line to cancel PGD generated gyrator for bandwidth extending
- Tape-out completed with Samsung 28nm RF CMOS.
- Fabricated circulator had a bandwidth of 65MHz, 13 times greater than that of narrowband counterpart.

RFIC Design for Retro-directive Beamforming *2021.04 – 2021.12*

Research Assistant

- Studied IC design flow and linux-based system management.

- Designed RFIC blocks: Low-noise amplifier (LNA) and drive amplifier (DA).
- Tape-out completed with Samsung 65nm RF CMOS.

PUBLICATION LIST

- **Q. -H. Do,** D. -N. Pham, and S. -W. Yoon, “Wideband CMOS Circulator IC using Non-Foster Elements,” (**submitted** to *IEEE Transactions on Microwave Theory and Techniques*)
- **Q. -H. Do**, D. -N. Pham and S. -W. Yoon, "Isolation-Enhanced Phase Conjugator Design for Retro-Directive Wireless Power Transfer System," in *IEEE Microwave and Wireless Technology Letters*, doi: 10.1109/LMWT.2025.3597259.
- **Q. -H. Do**, T. -B. Ngo, and S. -W. Yoon, "An Ultra-compact Fully Integrated Circulator in 28 nm CMOS IC Technology," *Journal of Semiconductor Technology and Science*, doi: 10.5573/JSTS.2025.25.2.184.
- **Q. -H. Do**, T. -B. Ngo, and S. -W. Yoon, "A CMOS Low-pass Filter with Group Delay Cancellation using Non-Foster Element Circuits," *Journal of Semiconductor Technology and Science*, doi: 10.5573/JSTS.2024.24.2.105.
- T. -B. Ngo, **Q. -H. Do**, and S. -W. Yoon, “Leakage Power Canceling Module with a Negative Capacitor for a Circulator’s Isolation,” *Journal of Electromagnetic Engineering and Science*, doi: 10.26866/jees.2023.2.r.151.
- T. -B. Ngo, **Q. -H. Do**, and S. -W. Yoon, "A Wideband Circulator Leakage Canceler for Retro-Directive RF System," in *IEEE Microwave and Wireless Components Letters*, doi: 10.1109/LMWC.2022.3170590.
- T. -B. Ngo, **Q. -H. Do**, and S. -W. Yoon, "A Compact 6-bit Phase Shifter in 65 nm RF CMOS Technology for ISM Band," *Journal of Semiconductor Technology and Science*, doi: 10.5573/JSTS.2022.22.3.198.

REFERENCES

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