

INFORMATION ON DOCTORAL THESIS

1. Full name: Bui Thi Ha
2. Sex: Female
3. Date of birth: 02/05/1985
4. Place of birth: Ha Noi
5. Admission decision number: 778/QĐ-CTSV Dated: August 21, 2017
6. Changes in academic process:
Thay đổi tên đề tài luận án tiến sĩ theo quyết định số 2254/ QĐ-ĐHQG, ngày 17 tháng 10 năm 2024 của Hiệu trưởng Trường Đại học Công nghệ, Đại học Quốc gia Hà Nội. Tên đề tài luận án cũ: **Nghiên cứu phát triển hệ thống truyền thông băng tần S mở rộng cho trạm mặt đất kết nối với vệ tinh quỹ đạo thấp NanoSatellite**
Change the Thesis title, decision number 2254/QĐ-ĐHQG, October 17, 2024. Older thesis title: **Research, development Communication subsystem of Ground station and Nanosatellite at expanded S band on Low Earth Orbit**
7. Official thesis title: **Research, development Communication subsystem of Ground station and Nanosatellite at S band on Low Earth Orbit.**
8. Major: Electronics Engineering
9. Code: 9520203
10. Supervisors: Prof. Bach Gia Duong
11. Summary of the **new findings** of the thesis:
 - Construction a design, fabrication solutions for transmitter of communication subsystem. The power amplifier has multi-stages with purpose increase dynamic range, wideband. Signal radio frequency was modulated directly. Flexible frequency change at VCO by using phase lock loop. In addition, the device and its working mode has been carefully selected also help to increase output power of transmitter, reduce size and weight of subsystem. If volume of satellite was reduced, the launch and manufacturing cost also reduce. This system was suitable for small satellite and its ground station.
 - Construction a receiver module has high sensitivity, low noise figure, high gain and large dynamic range. The low noise amplifier has good impedance matching. Down converter has low loss signal, intermediate frequency amplifier with multi-stages obtains high gain. This receiver structure be able to apply for ground station receive the signal of satellite at S band. Also, it can be developed to apply for nanosatellite at S band.
12. Practical applicability, if any:

This thesis has practical significance in gradually mastering technology in the field of manufacturing small satellites in Vietnam. With the solutions and research results achieved, these proposals can be developed and applied to satellites into operation in space. At the same time, it contributes to reducing the cost of manufacturing and launching satellites

13. Further research directions, if any:

- Continue to develop transceivers to be able to operate at higher frequencies.
- Tập trung nghiên cứu về ăng ten, nâng cao hệ số khuếch đại để tối ưu hơn nữa bộ thu phát.
- Focus on antenna research, improve amplification factor to further optimize transceivers.
- Develop transmitter and receiver configurations in the direction of miniaturization, and at the same time build algorithms to optimize transmitter power consumption to bring to satellites.

14. Thesis-related publications:

[CT1] **Bui Thi Ha**, Tran Chinh Doan, Nguyen Tien Dat, Bach Gia Duong (2019), “Research, Design, Fabrication Receiver of Ground station for Vietnamese Satellite at S band with digitalizing I/Q channel at Intermediate frequency”, *2019 International Conference on Advanced Technologies for Communications (ATC)*, pp 179-184.

[CT2] **Bui Thi Ha**, Bach Gia Duong (2019), “Research, Design and Fabrication Microwave Modules of Receiver for NanoDragon Satellite at S band”, *Journal of Mathematics – Physics, Vietnam National University, Hanoi*, Vol.35, No.2 (2019), pp. 50-59

[CT3] **Bui Thi Ha**, Tran Chinh Doan, Le Xuan Huy, Bach Gia Duong (2020), “Design and manufacture power pre-amplifier module for transmitter of ground station at S-band”, *The 2020 IEEE Asia Pacific Conference on Circuits and Systems (APCCAS)*, pp. 153-156.

[CT4] **Bui Thi Ha**, Tran Chinh Doan, Bach Gia Duong (2020), “Design, Fabrication Transmitter Modulator at S band for MicroSatellite with the direct RF input”, *The 13th International Conference on Advanced Technologies for Communication (ATC)*, pp.222-226

[CT5] **Bui Thi Ha**, Tran Chinh Doan, Bach Gia Duong (2022), “Design and implementation of an S-band transmitter for nanosatellite with new configuration”, *Indonesian Journal of Electrical Engineering and Computer Science*, Vol 25, No.2, February 2022, pp.1067-1077.

[CT6] **Bui Thi Ha**, Bach Gia Duong (2024), “Design and implementation of an S-band receiver for small satellite based on the manufactured subsystems”, *VNU Journal of Science: Mathematics – Physics*