

SUNG KYUN KWAN UNIVERSITY(SKKU)



SAINT 성균나노과학기술원
SKKU Advanced Institute of Nanotechnology

SICQE 양자공학혁신연구소
SKKU Innovation Center for Quantum Engineering

2026.09.14. Kor-US Nano Forum, NC

Scalable superconducting quantum processor in SKKU QFab : *toward quantum foundry*

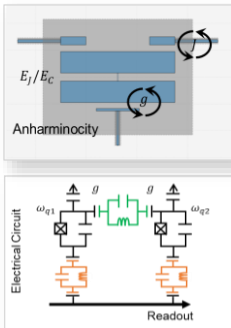
Yonuk Chong

SKKU

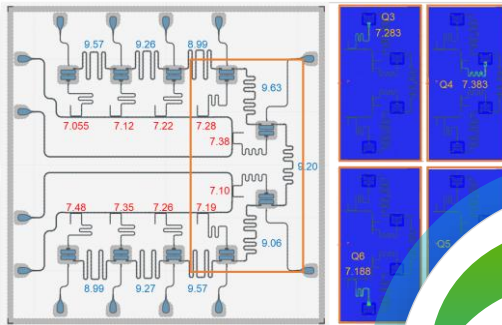
Dept. of Quantum Information Engineering

Qubit Device Design & Simulation

Qubit Design

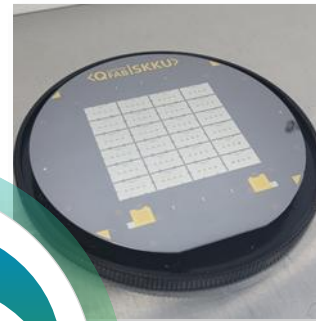


Device Simulation

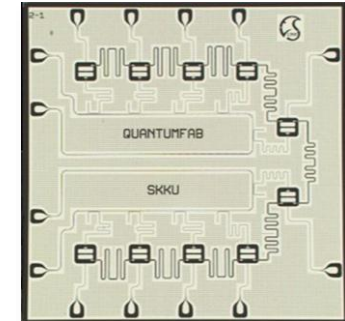


Quantum Processor Fabrication

Wafer-scale Fabrication

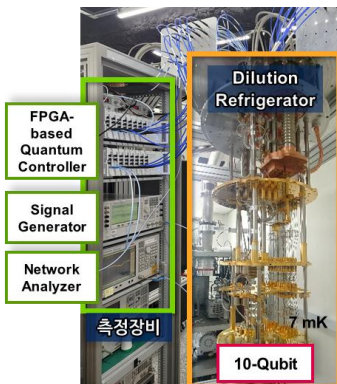


10-Qubit Device

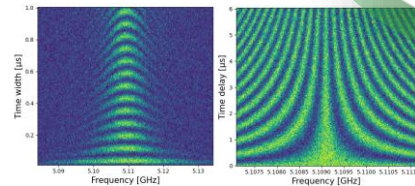


Quantum Control & Measurement

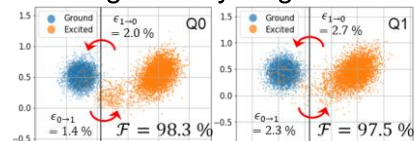
Quantum Gates & Applications



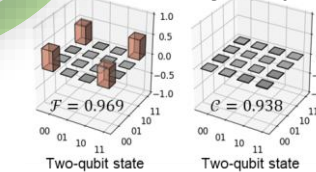
Coherent Measurement



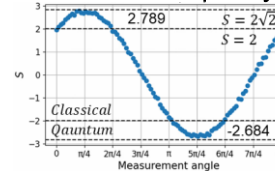
High-fidelity single-shot



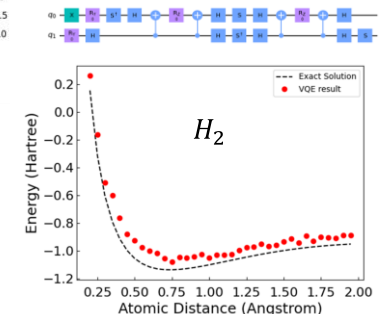
State Tomography



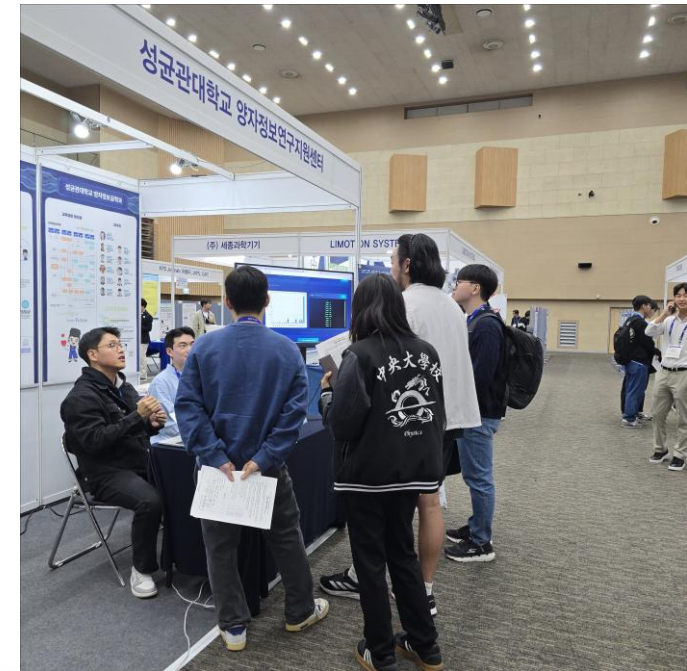
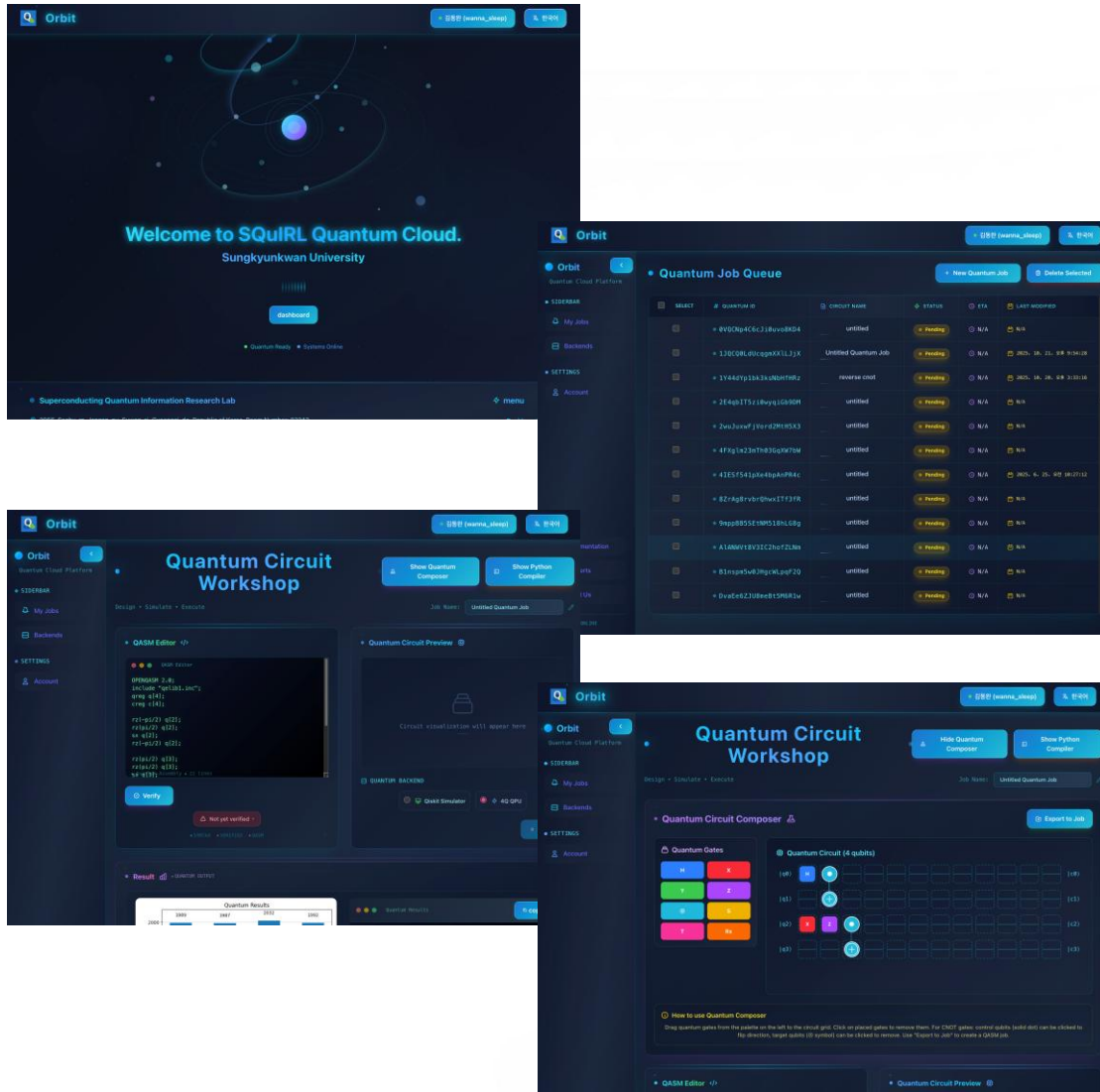
CHSH Inequality



Variational Quantum Eigensolver (VQE)



Chips on Cloud – Full-stack Demonstration



KPS Fall Meeting, 2025

www.qfab.kr



HOME

Introducing Quantum Fab

Unit Process Services

Batch Process Service

Process



QFab
Quantum Fabrication

We support your quantum research

The quantum fab will contribute to expanding the base and enhancing capabilities in the quantum research field.



< 1 / 3 >



Greetings
Greetings



History
Terms of Use



Location
Directions

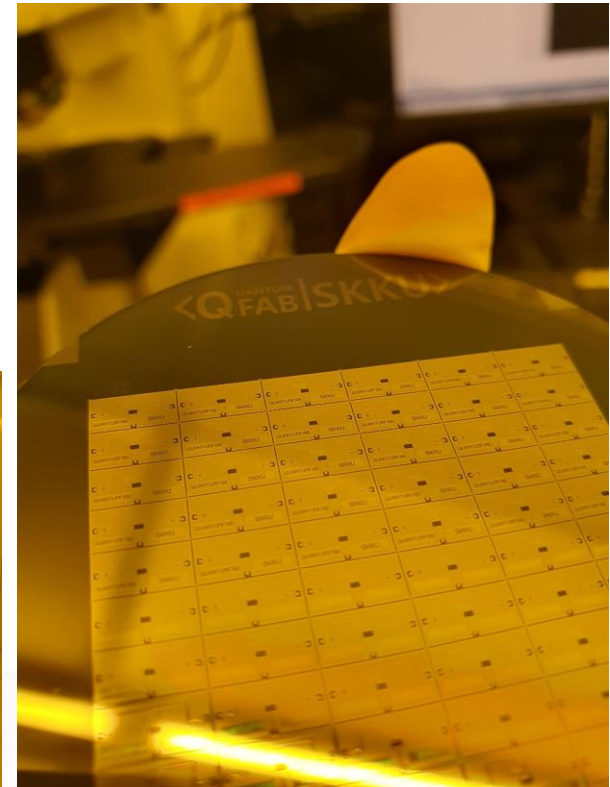
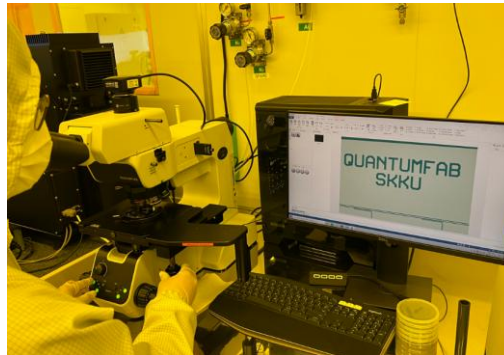
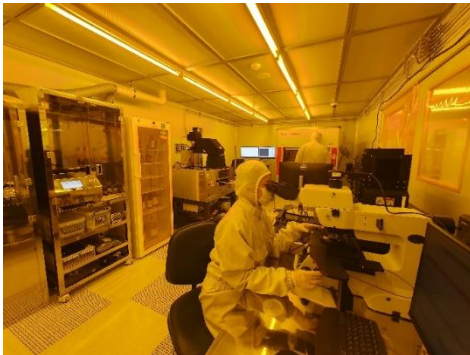
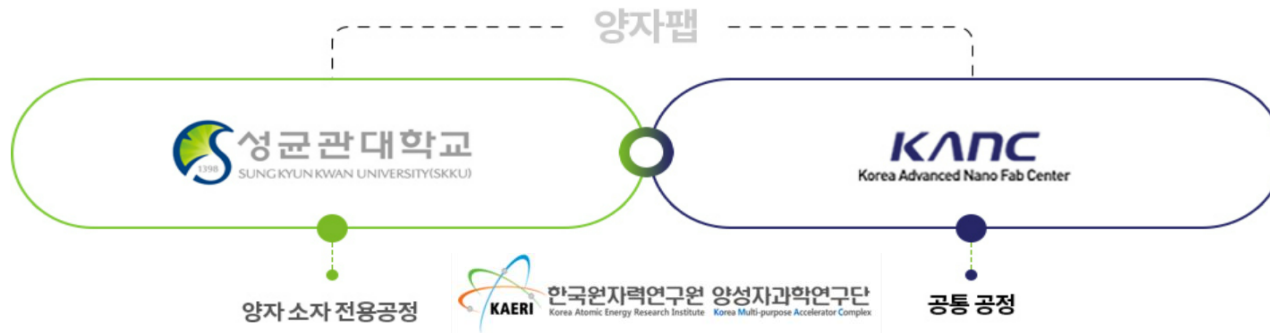
About QFab

In order to develop cutting-edge technologies that will lead the 21st century quantum revolution, we established a quantum fab in 2020 to provide unit/batch process services.

Leveraging National Nanofab Infrastructure

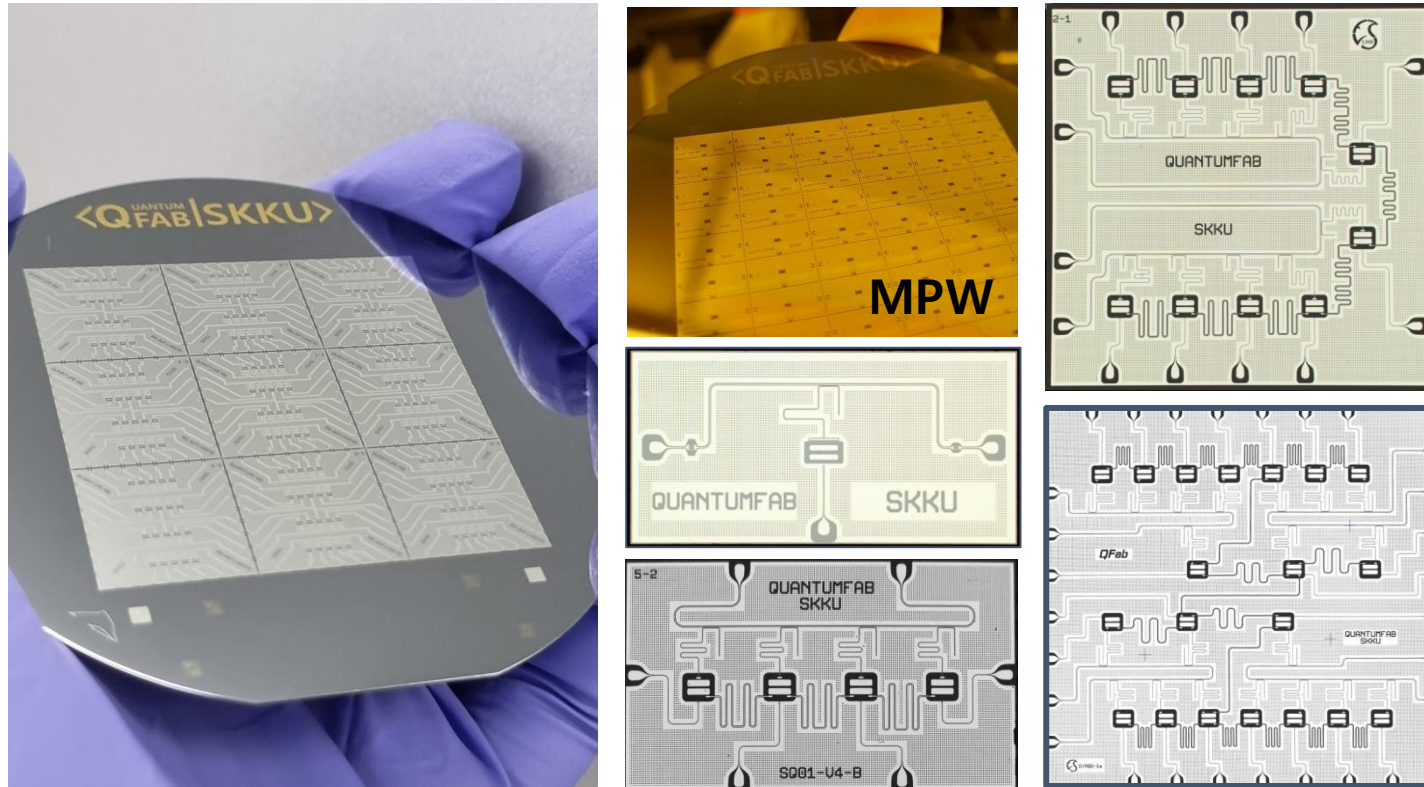


Quantum Fab (QFab)



Currently 3-4-6 inch wafer process, based on your GDS.

www.qfab.kr

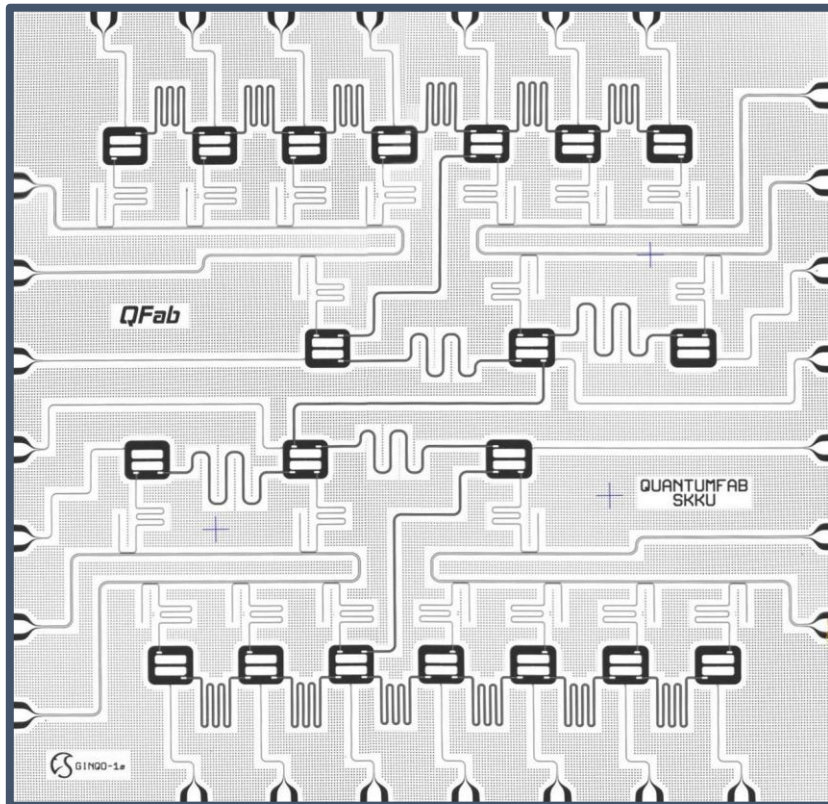


Tape-out every Quarter / max 10 qubits for standard R&D process
Collaboration projects for larger (20+) circuits.

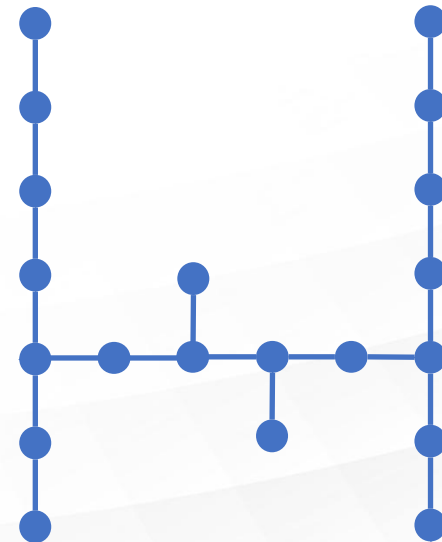
In the future, PDK will be provided, with a design house.

20Q Device : GINQO-1a Processor (2023)

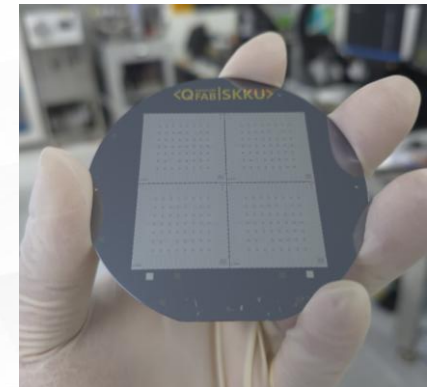
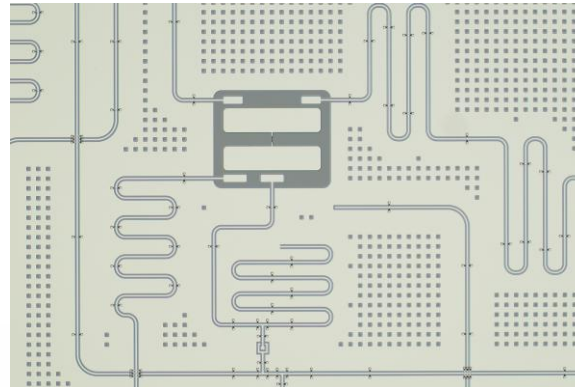
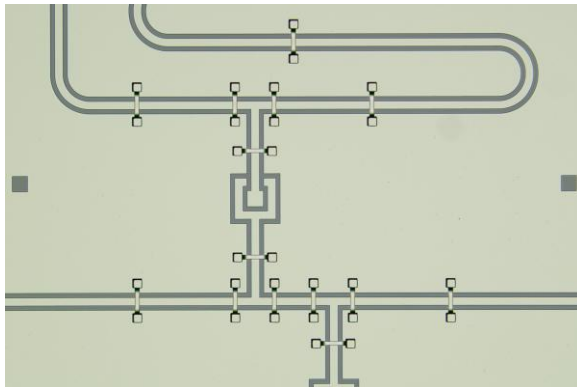
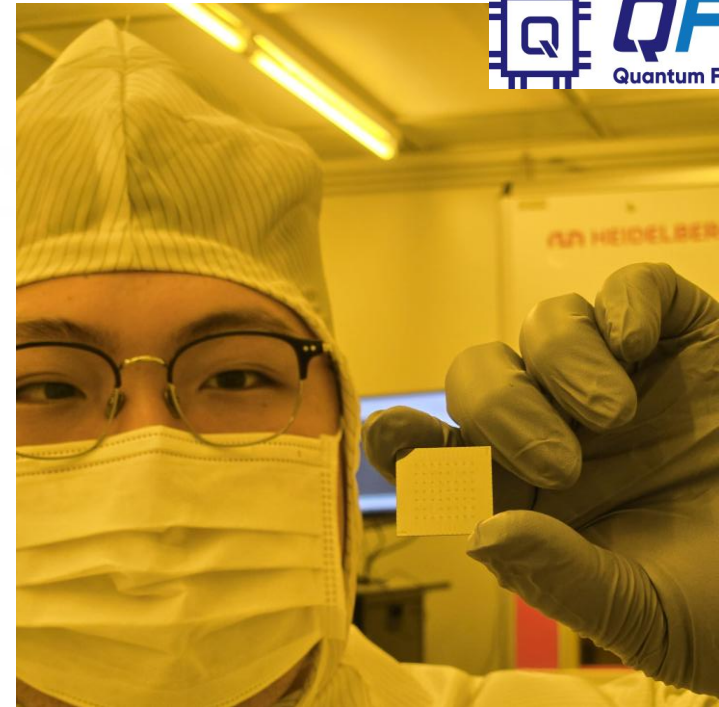
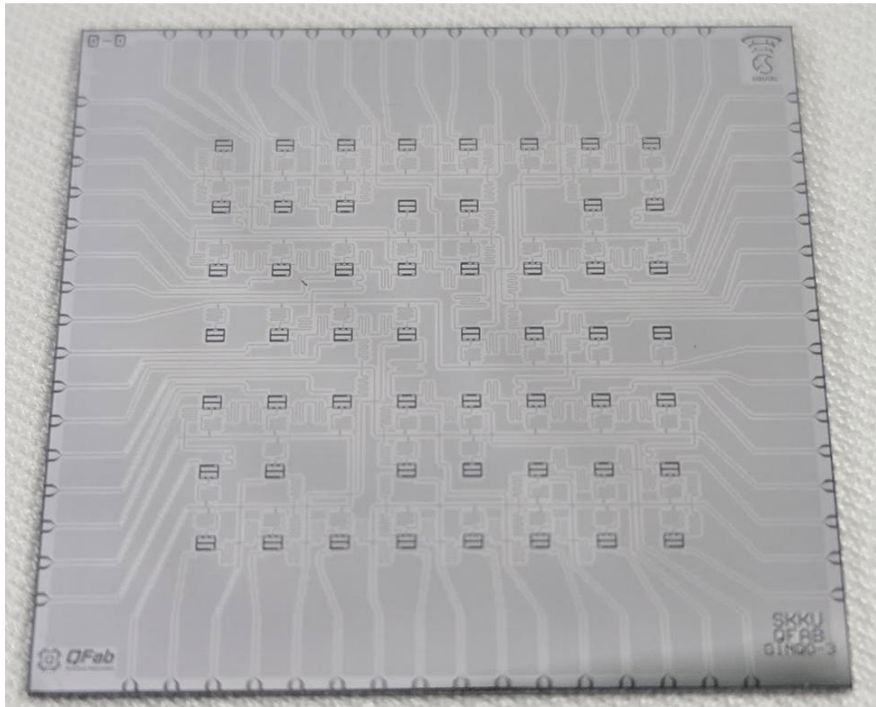
Code Name : **GINQO-1a** processor
(**G**eneral-purpose **I**ntegrated **Q**uantum **O**peration processor)



5 Qubits per Feedline
1 Readout Resonator & Drive
per Individual Qubit
32-pin package



(50+4)Q Device : GINQO-3a Processor (2025)



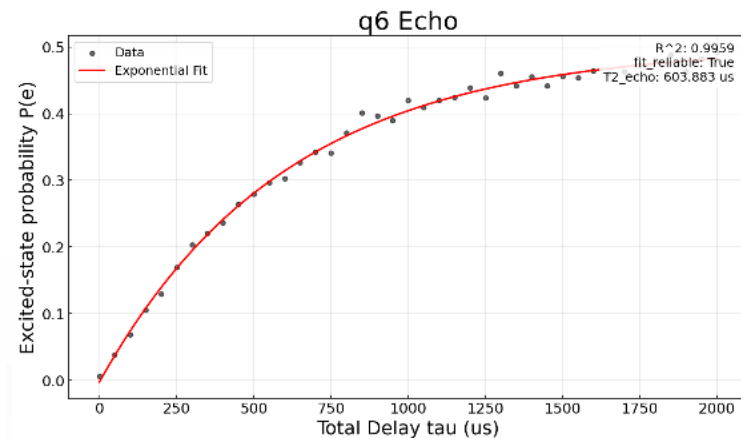
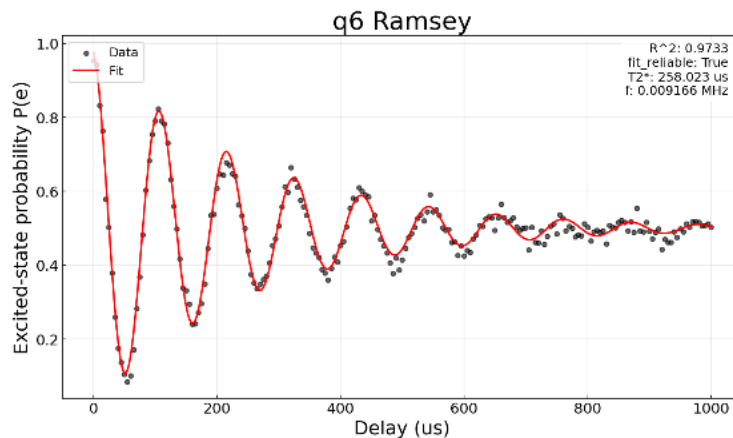
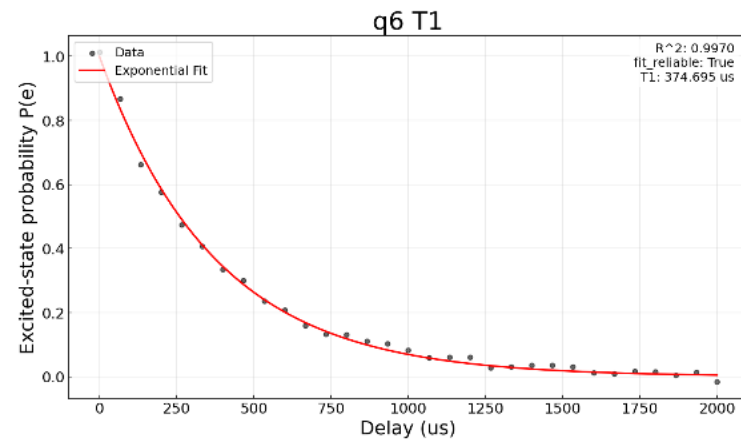
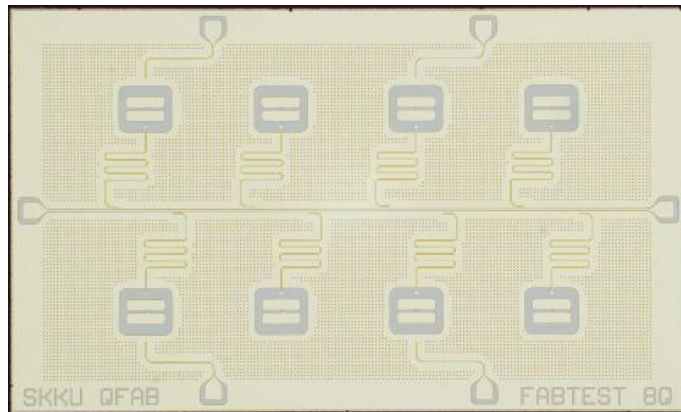
Qubit Device

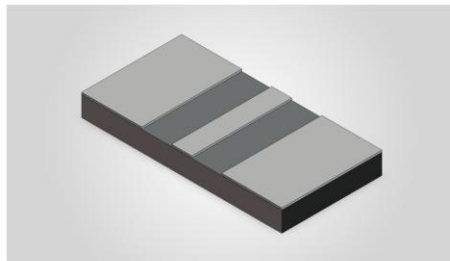
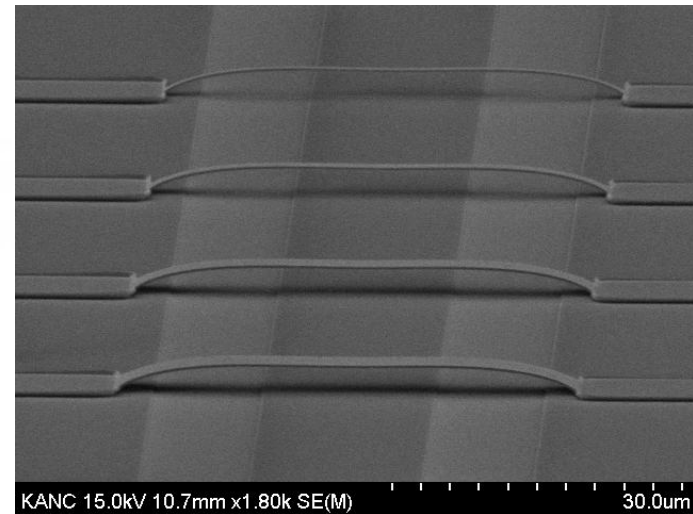
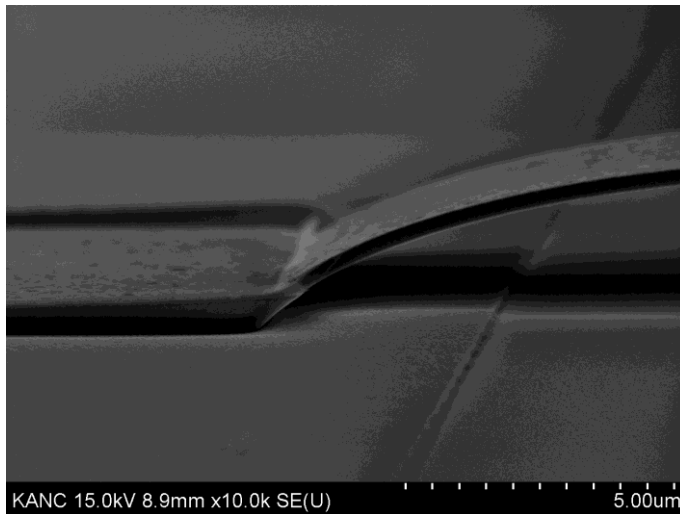
- Nb base electrode
- Al/AlOx/Al Manhattan JJ

T1 374 us

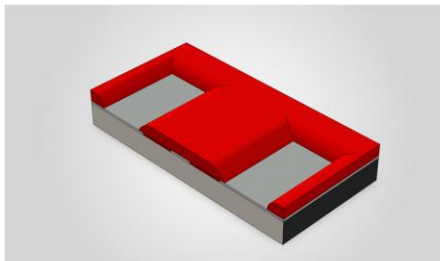
T2* 258 us

T2e 603 us

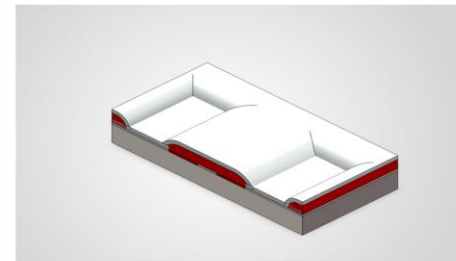




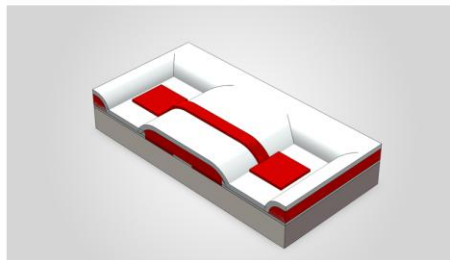
(a) CPW



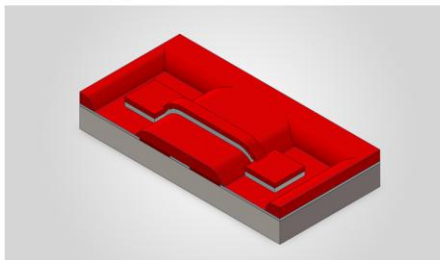
(b) Scaffold lithography & reflow



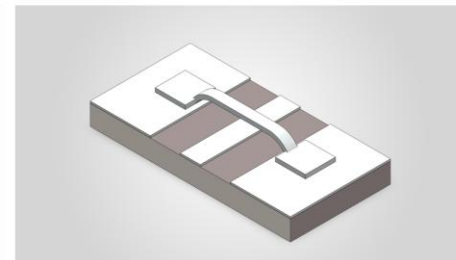
(c) Aluminum deposition



(d) Airbridge lithography

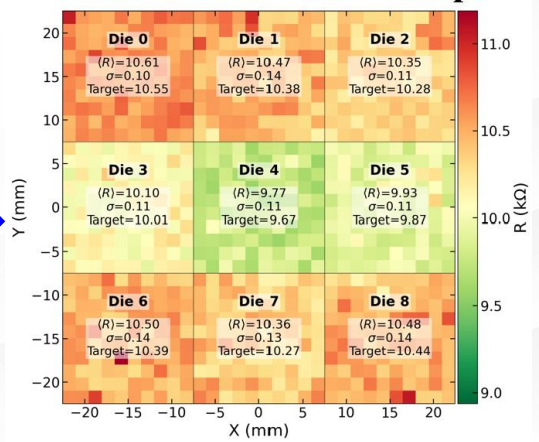
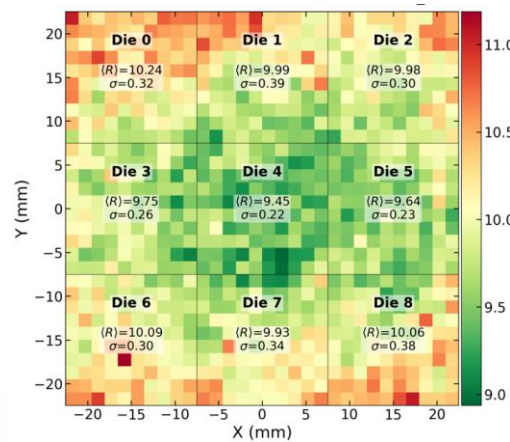
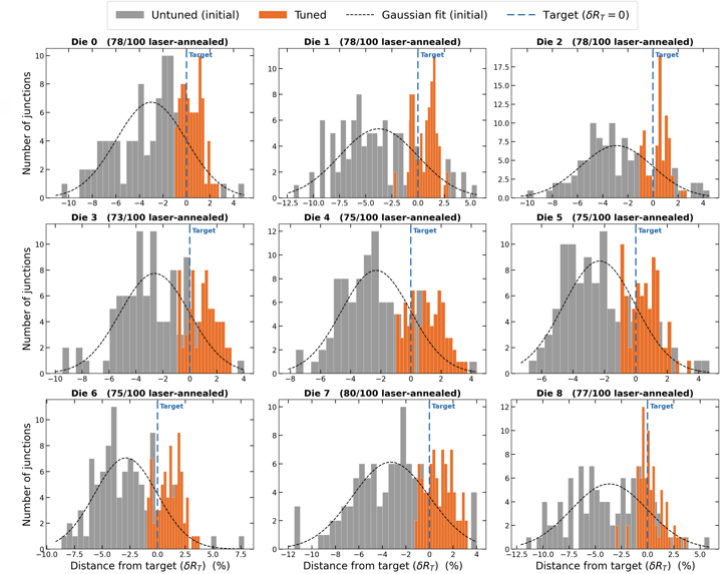
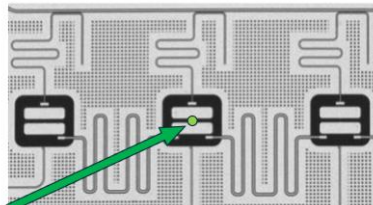
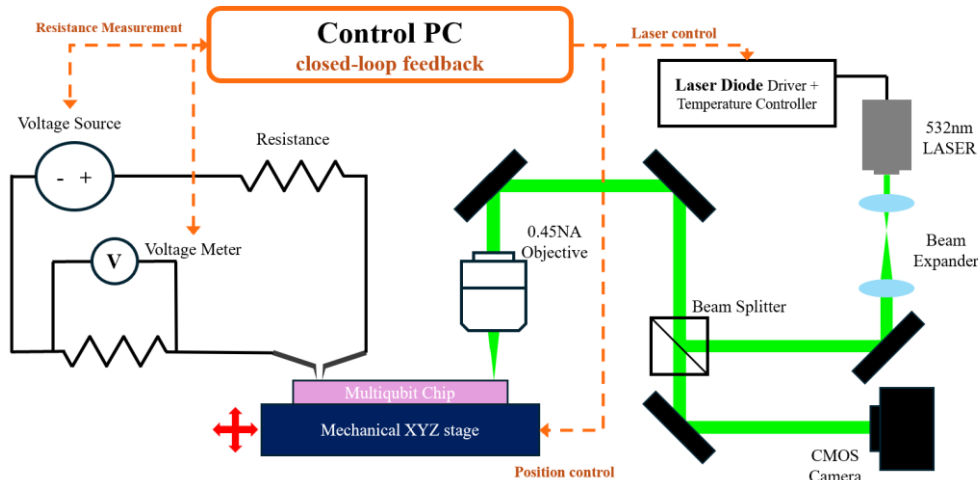


(e) Aluminum etching

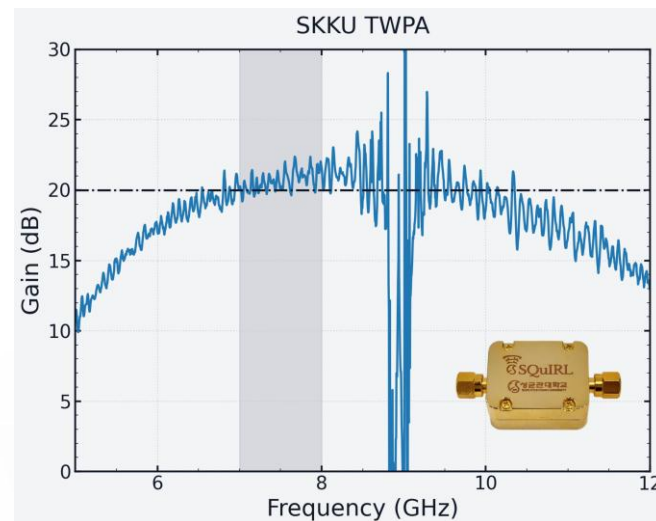
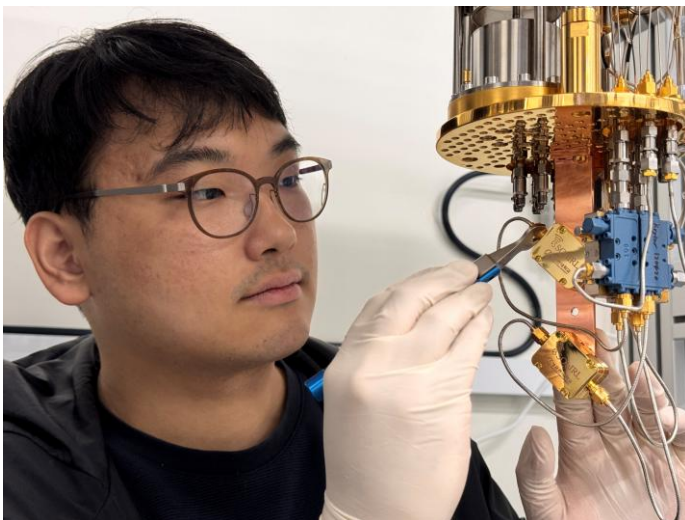
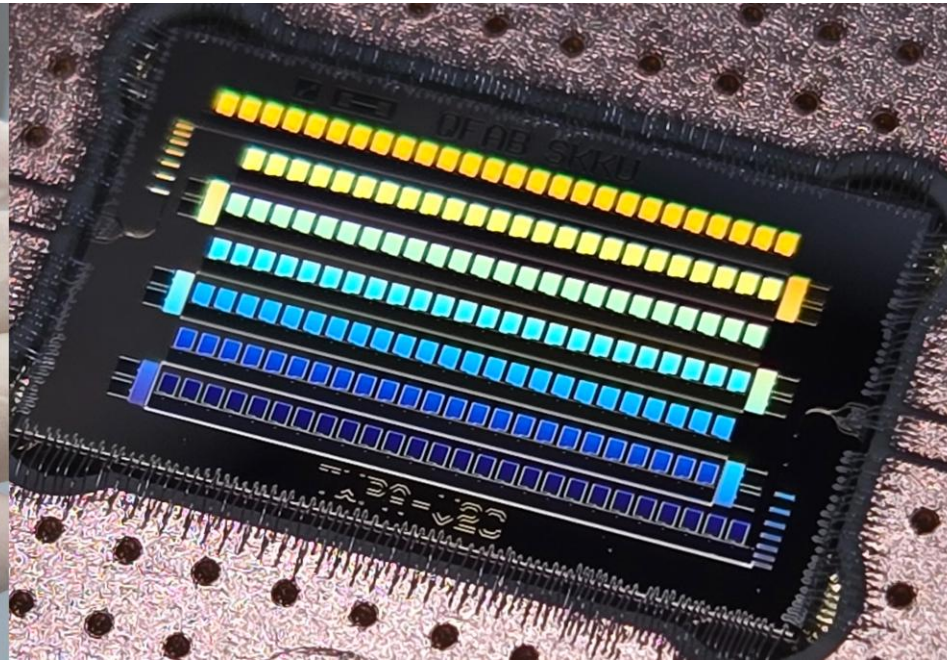
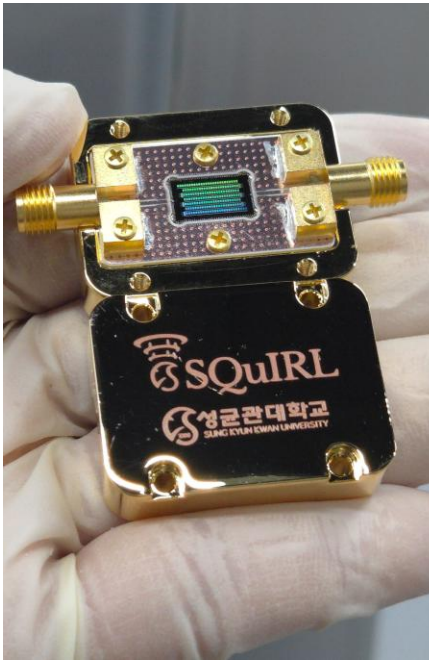


(f) Resist cleaning

Automated Laser Annealing Setup



TWPA: Travelling Wave Parametric Amplifier



lollipop structure

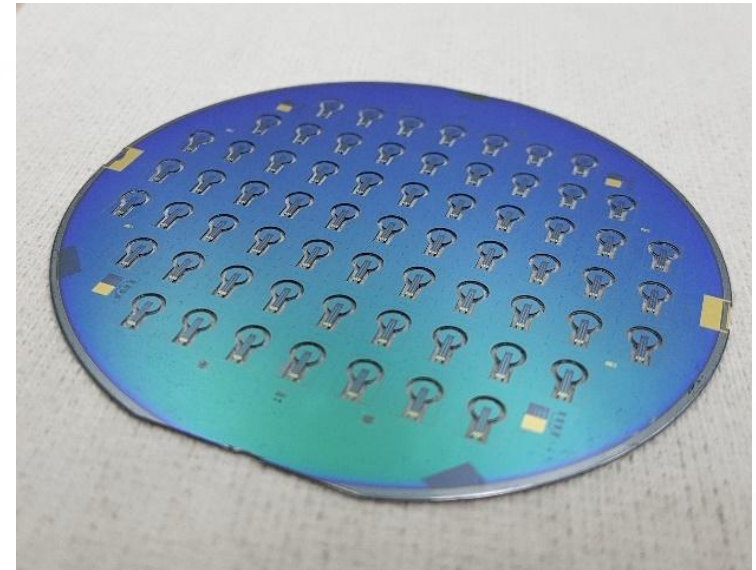
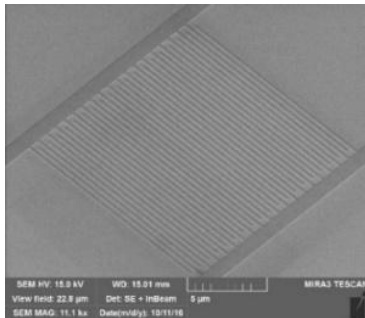
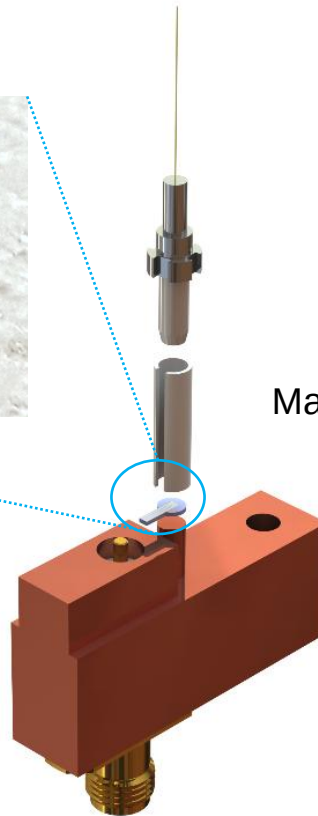


PC ferrule

Mating sleeve

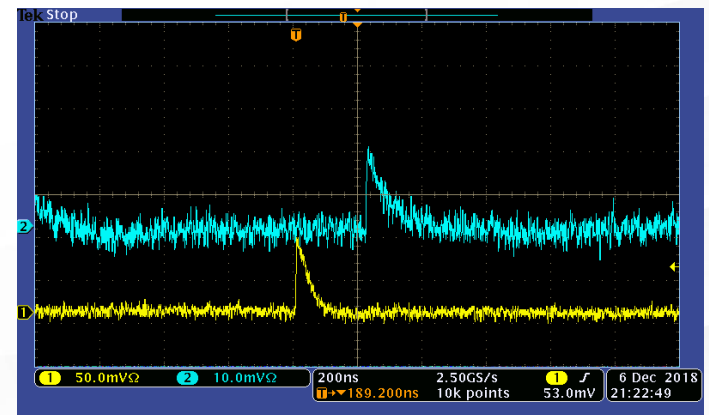
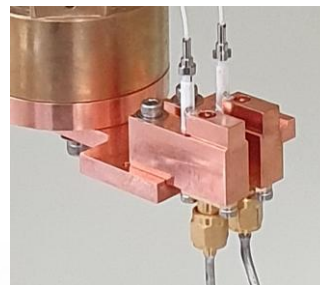
SNSPD

Holder



[Aaron J. Miller, Opt. Express 19, 9102–9110 (2011)]

[Yonuk Chong, Progress in Superconductivity and Cryogenics (PSAC) 19(4), pp. 22-25 (2017)]





www.qcenter.kr



KOR

ENG



Nurturing Quantum Information Talents of the Future

Qcenter supports human resource development, construction of infrastructure, and research activities in the domestic quantum information science sector.

About Us

Quantum Information Research Support Center



Talent Development

Training programs for research personnel



Quantum Fab



Quantum Cloud



Activity

Photos from the Qcenter's activities



Vision



Organization



Directions

QUANTUM INFORMATION RESEARCH SUPPORT CENTER

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TOP





<http://quantum.skku.edu>

We recruit Postdocs, Students, QFab Engineers

prof. Yonuk Chong (yonuk@skku.edu)



SUNG KYUN KWAN UNIVERSITY(SKKU)



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SKKU Advanced Institute of Nanotechnology

SICQE 양자공학혁신연구소
SKKU Innovation Center for Quantum Engineering

THANK YOU

Yonuk Chong

SKKU

Dept. of Quantum Information Engineering

 양자정보연구지원센터
Quantum Information Research Support Center


SQIRL

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Quantum Fabrication