



HSCS Winter Seminar

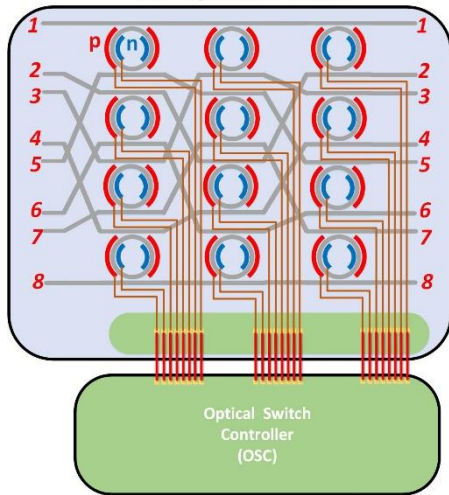
(27, Jan, 2026)

• Project

CMOS 호환 초저전력
이종접합/비휘발 자가재구성
광스위치 기술개발

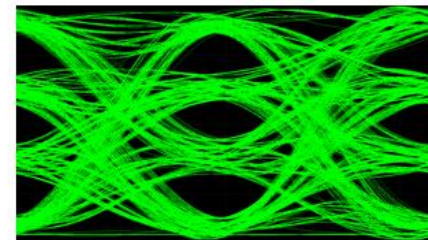
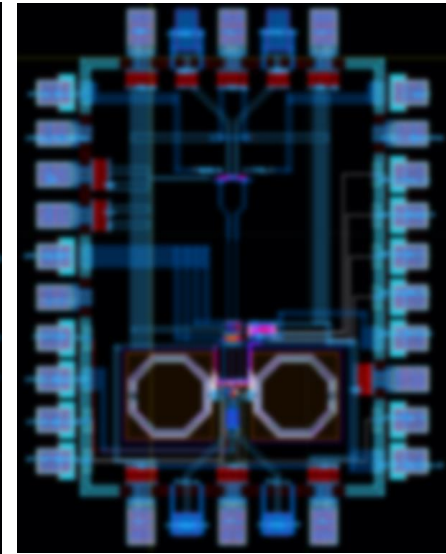
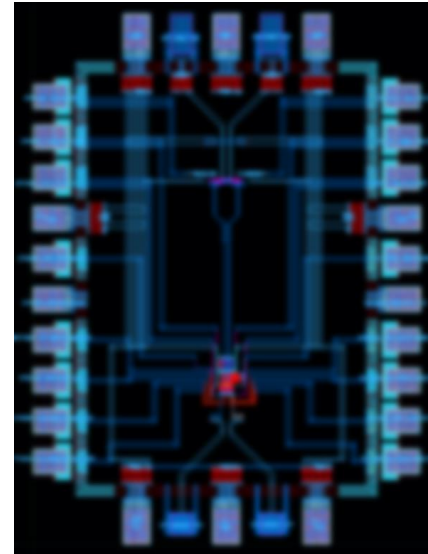


8x8 Optical Switch



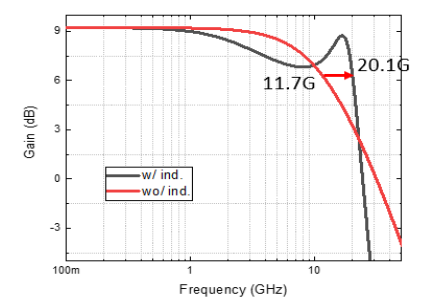
Tx	Rx	S1	S2	S3	S4
1	1	0	0	X	X
1	2	0	1	X	X
1	3	1	X	0	X
1	4	1	X	X	1
2	1	1	0	X	X
2	2	0	1	X	X
2	3	0	X	0	X
2	4	X	X	X	1
3	1	X	1	0	X
3	2	X	1	0	X
3	3	X	X	1	0
3	4	X	X	1	1
4	1	X	1	1	X
4	2	X	0	1	X
4	3	X	X	1	0
4	4	X	X	0	0

• Tape out

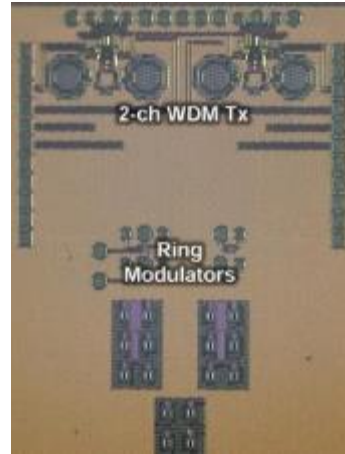
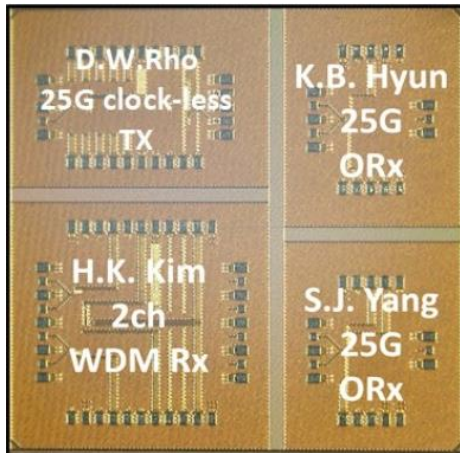


w/ 15GHz BW (cable + oscillo)

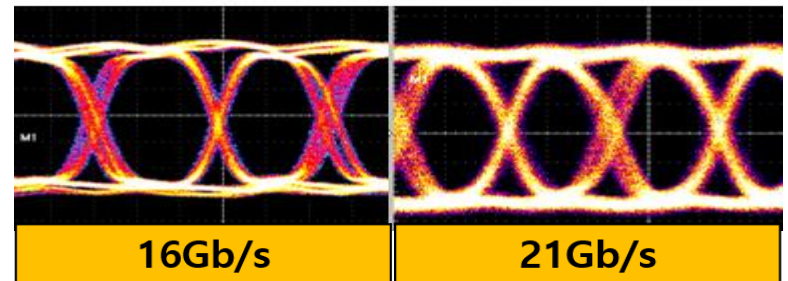
Driver's AC Simulation



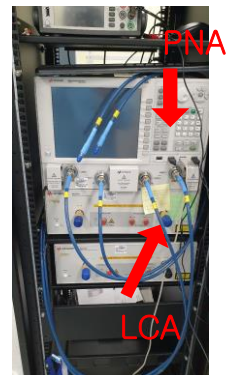
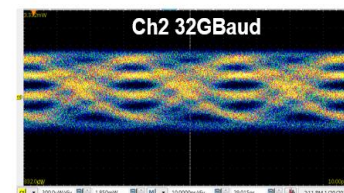
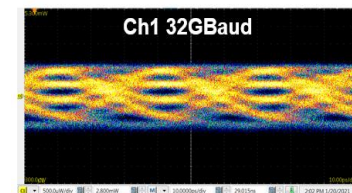
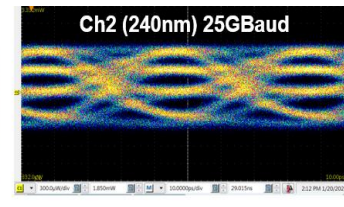
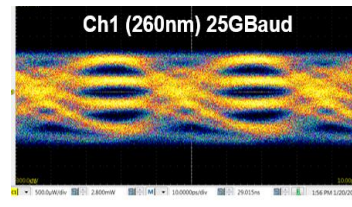
- Fab-out



- Measurement



- Workshop



ETRI, GwangJu, 2021

Conference

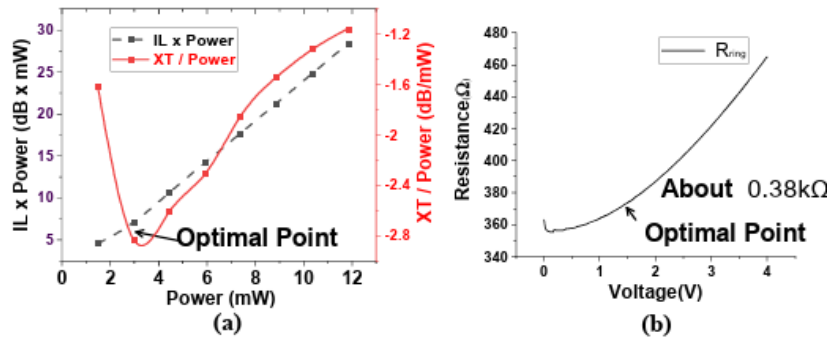
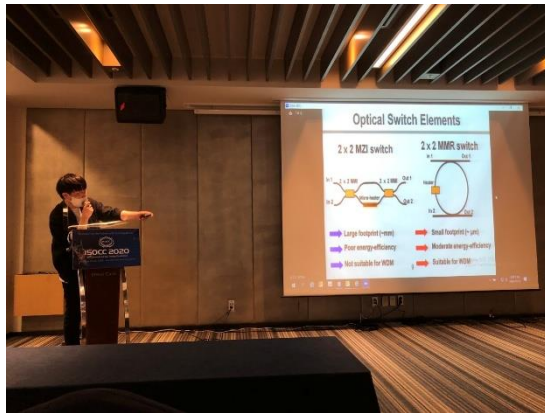


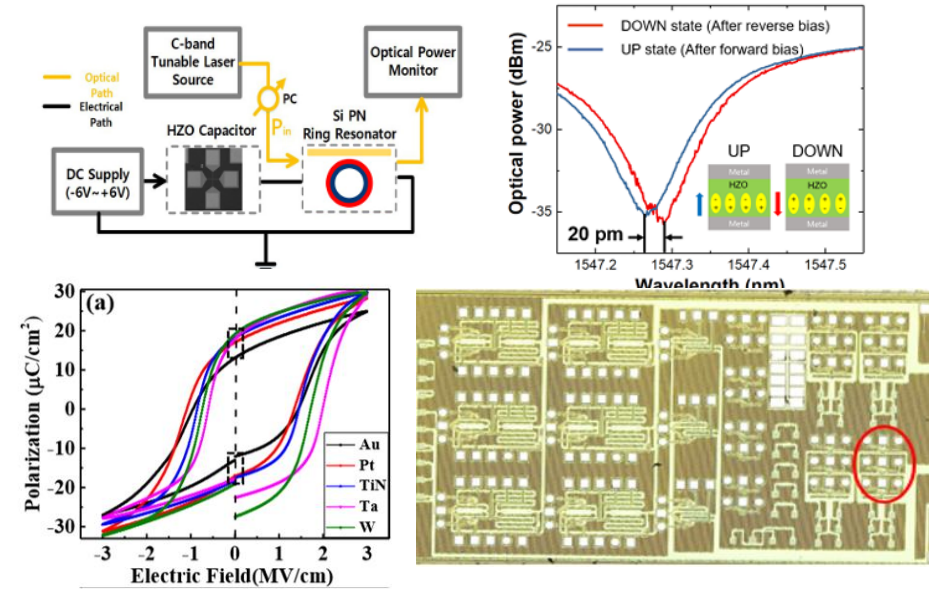
Figure 4. (a) IL, XT according to input power, (b) resistance result



ISOC, Yeosu, 2020



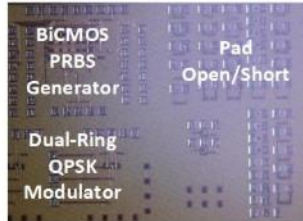
Non-Volatile Resonator Operation with HZO



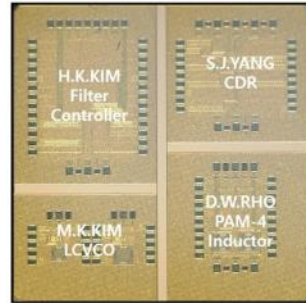
OFC, Virtual (COVID 19) 2021

2020-2021

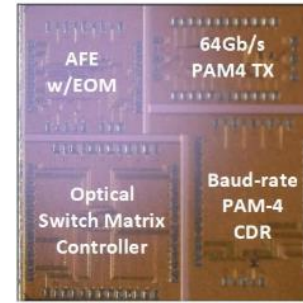
• Tape-out



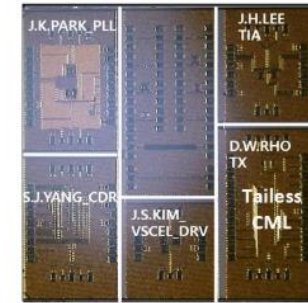
- **Fabrication time:** 20.5 ~ 21.3
- **Process:** IHP, SG25H5, EPIC (Cu BEOL)
- **Contents:** BiCMOS High-speed PRBS generator, Dual-Ring QPSK Modulator, POS



- **Fabrication time:** 20.3 ~ 20.9
- **Process:** Samsung, CMOS 28-nm Planar
- **Contents:** PAM-4 TX with CML Driver with Inductor, CDR, LC VCO



- **Fabrication time:** 21.4 ~ 21.9
- **Process:** Samsung, CMOS 28-nm Planar
- **Contents:** 64-Gb/s PAM-4 TX rev., Baud-rate PAM-4 CDR, Optical switch matrix, AFE

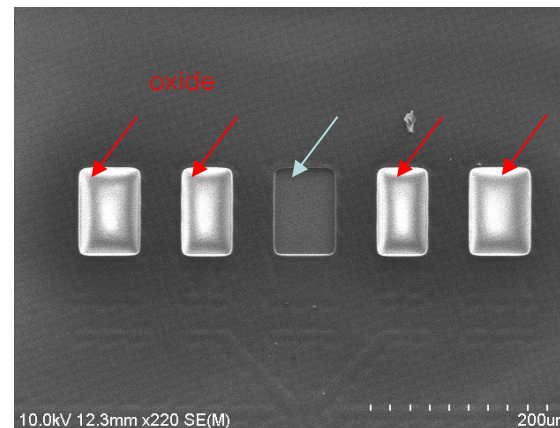


- **Fabrication time:** 21.10 ~ 22.3
- **Process:** Samsung, CMOS 28-nm Planar
- **Contents:** 100-Gb/s Tailless CML Driver, PLL, PAM-4 CDR, VSCSEL Driver (Proto-type)

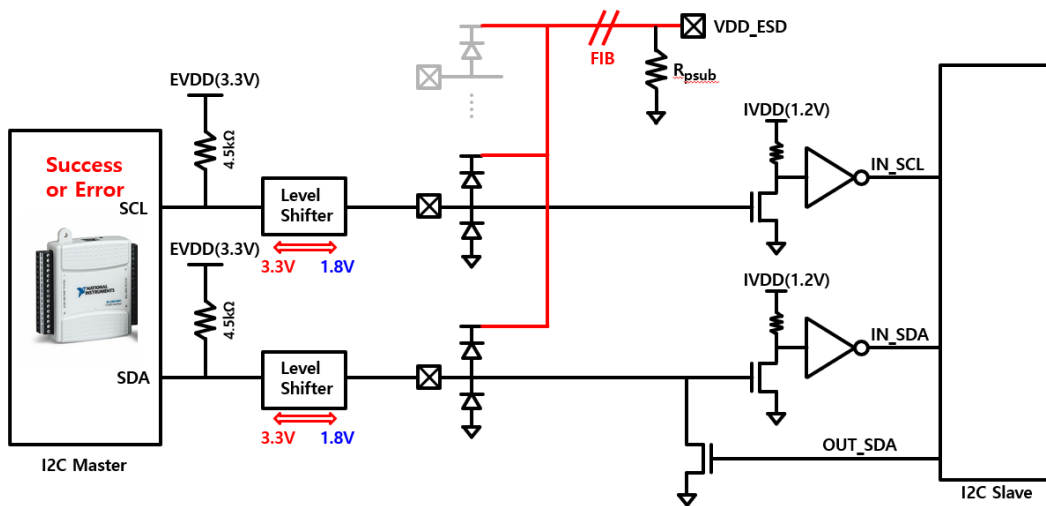
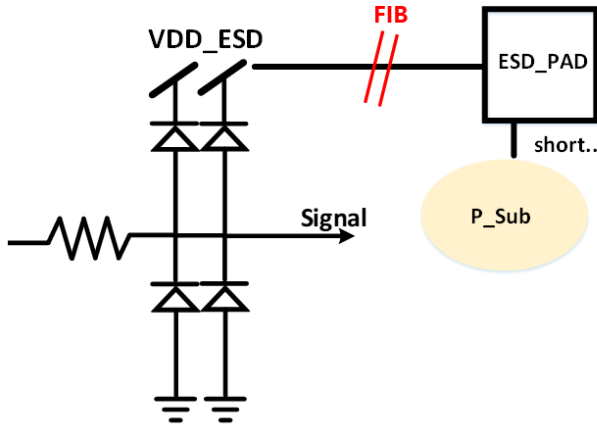
• Debugging



Passivation problem

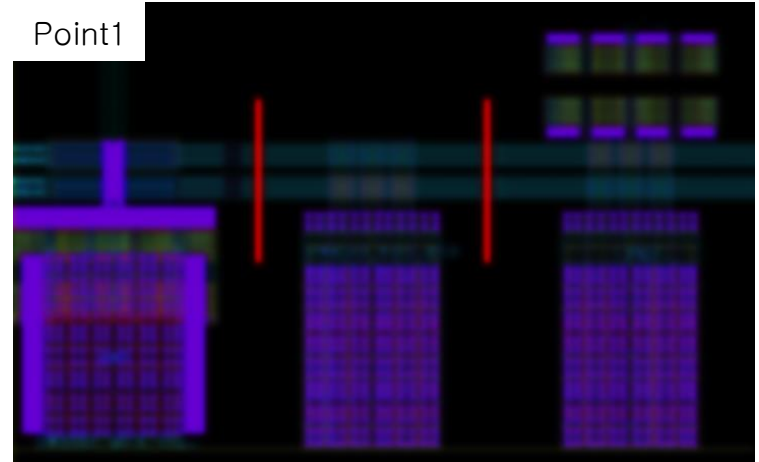


• Debugging



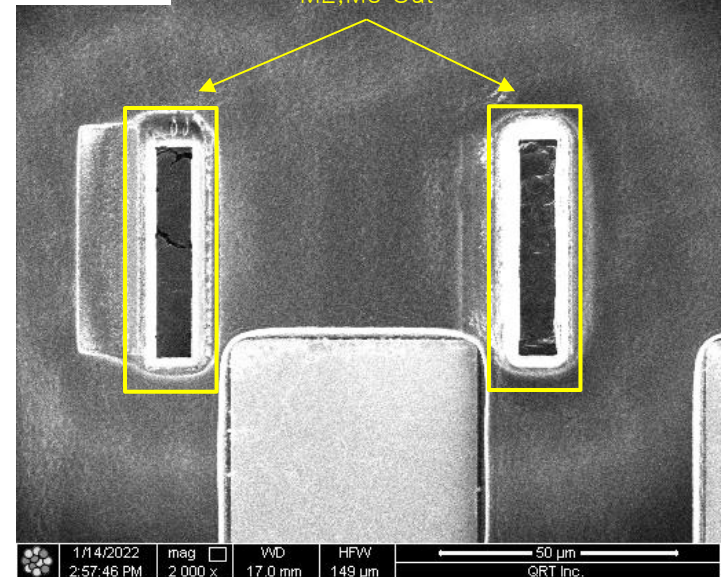
ESD issue observed

Point1



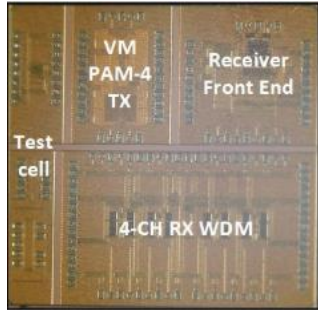
D.W. Rho

M2,M3 Cut

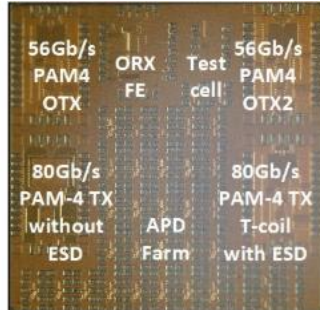


2022-2023

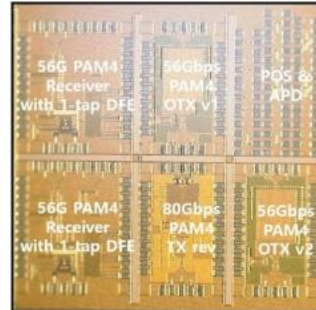
• Tape-out



- **Fabrication time:** 22.4 ~ 22.9
- **Process:** Samsung, CMOS 28-nm Planar
- **Contents:** 4-ch WDM RX, AFE, Voltage-mode PAM-4 Driver, Test cell



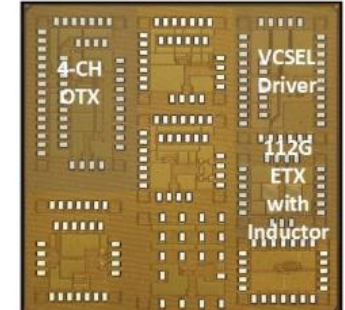
- **Fabrication time:** 22.7 ~ 22.11
- **Process:** Samsung, CMOS 28-nm Planar
- **Contents:** 56-Gb/s PAM-4 Optical TX, 80-Gb/s PAM-4 TX with T-coil



- **Fabrication time:** 22.10 ~ 23.04
- **Process:** Samsung, CMOS 28-nm Planar
- **Contents:** 80-Gb/s PAM-4 TX rev, 56-Gb/s PAM-4 Optical TX rev, POS & Avalanche photo detector (APD)

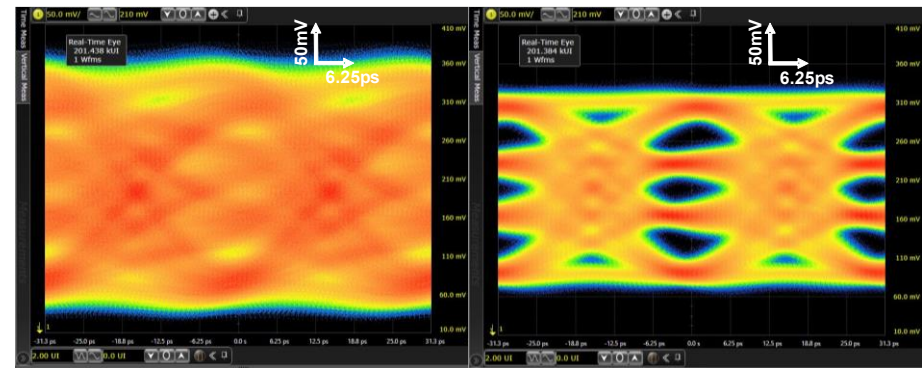
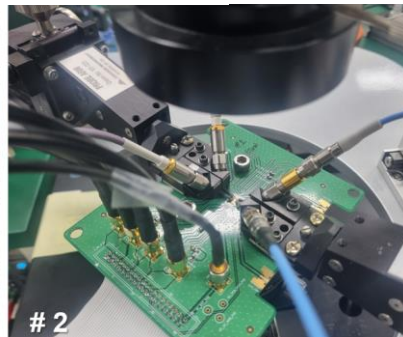


- **Fabrication time:** 23.4 ~ 23.10
- **Process:** Samsung, CMOS 28-nm Planar
- **Contents:** 4-ch ORX with histogram monitor, MRM TX with/without DC block.



- **Fabrication time:** 23.10 ~ 24.03
- **Process:** Samsung, CMOS 28-nm Planar
- **Contents:** 4-ch OTX, VCSEL Driver, 112-Gb/s ETX with Vessel Filter

• Measurement



2022-2023

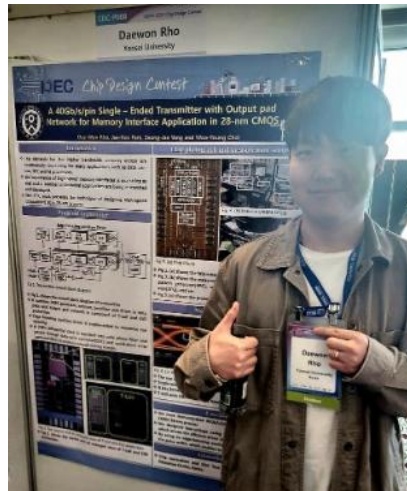
- Conference



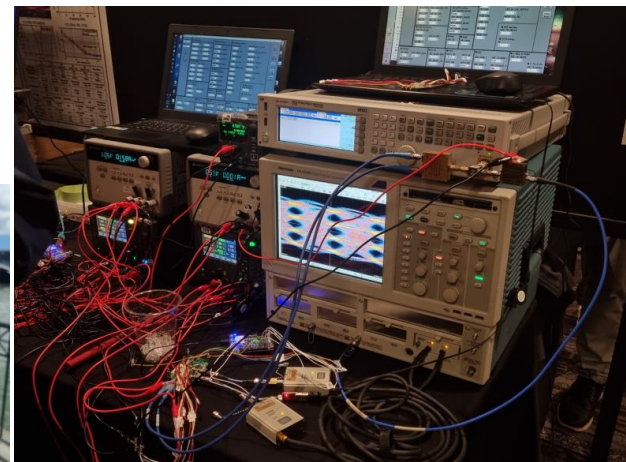
A-SSCC, Hainan, 2023



Nonsan, 2023



ISOCC (CDC), Jeju, 2023

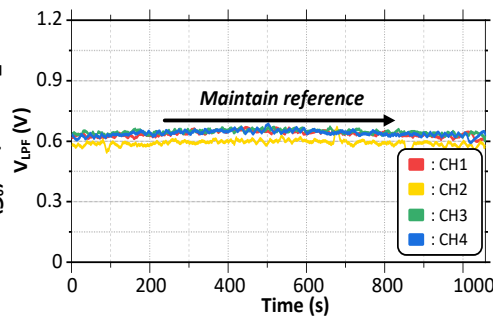
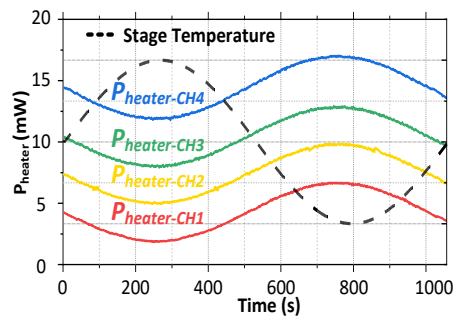
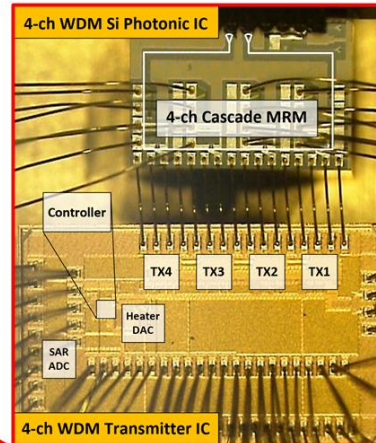
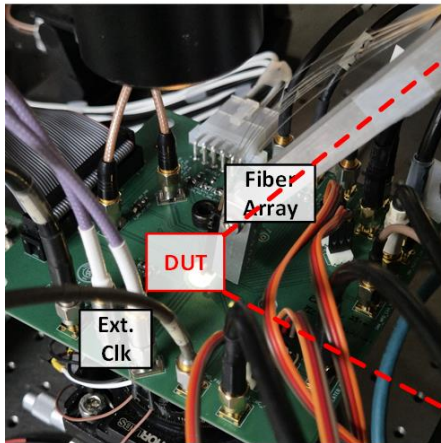


ISSSC 2024, San Francisco

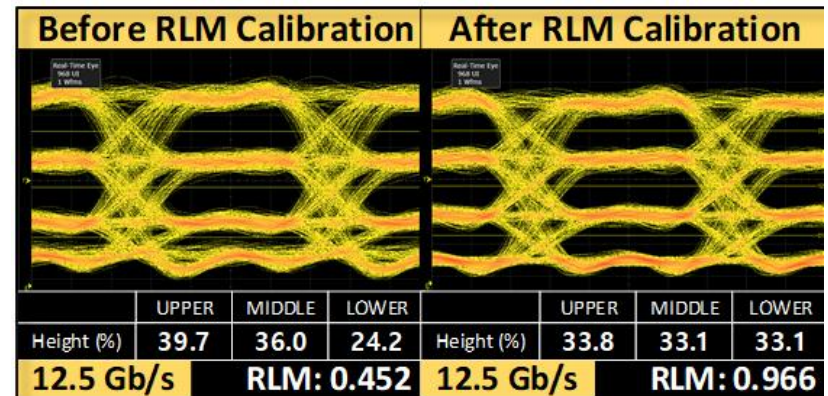
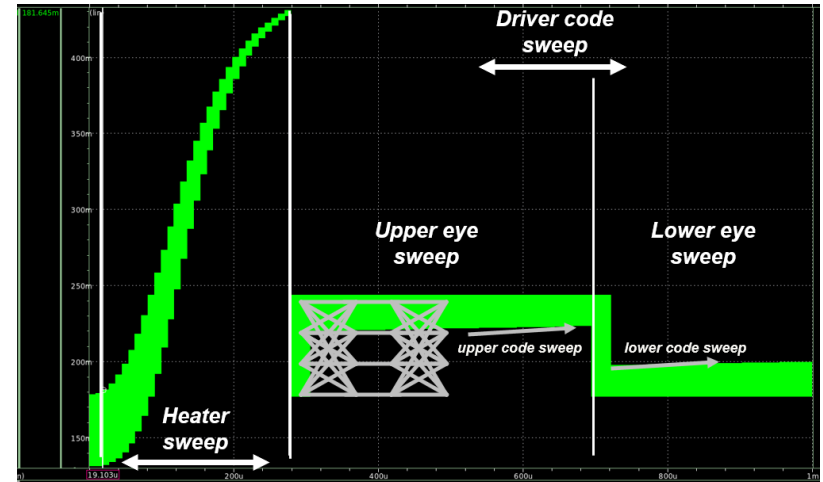
2024-2025

• Tape-out

Temperature control



RLM control



2025

- Conference



OFC 2025, San Francisco

- Journal



Feb. 2025



Nov. 2025

- Conference



OFC 2026, Los Angeles

- Dissertation

