

Circuit Lab

Electrical Engineering | KAIST

Contact information

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Website : <https://www.ICdesignLab.net/>

Current state of the Lab. (in 2025 Spring Semester)

Ph.D. Students : 11 Master's Student : 8

Research Areas

Our research group is focused on innovations in the CMOS integrated chip designs of analog IC, DDI, PMIC, ROIC, and CIS. And, ultimately we plan to build a complete system-on-a-chip solution by incorporating our knowledge in those fields.

Power Conversion and Management IC (PMIC)

- Switch-mode DC-DC power converter using inductive, capacitive, and hybrid techniques
- Fully-monolithic high-speed switching PMIC for modern SoCs
- Energy-harvesting interface circuit and system
- Fast-response high-PSR low-dropout (LDO) regulator
- Battery charger and management circuit

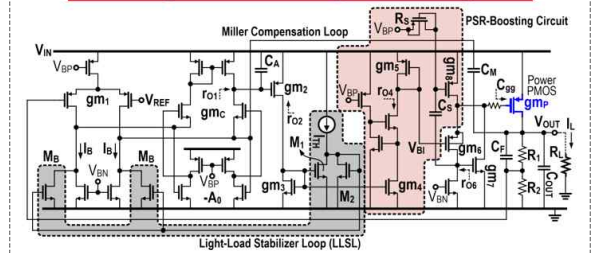
Display Driving Circuits and Systems

- High-resolution area-efficient digital-to-analog converter (DAC)
- OLED display driver with pixel-readout and active-compensation
- Low-power high-speed output driving buffer amplifier
- Fully-integrated system-on-wafer (SoW) for micro-LED displays
- Displays with touch-sensing functionality

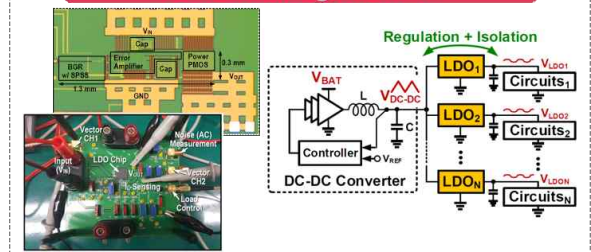
Readout IC (ROIC) and Imaging Sensor

- Low-noise high-sensitivity readout circuit and system
- Ultra-high-speed time-delayed integration (TDI) image sensor
- Photon-counting detector for nuclear particles and X-ray

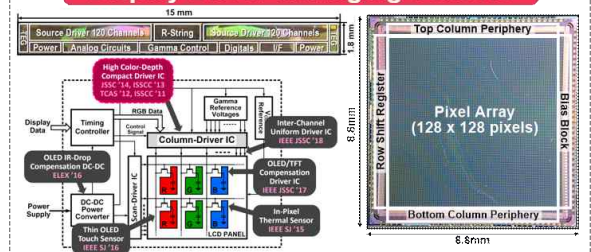
Analog Circuit Design Techniques



Power Management IC



Display Driver & Imaging Sensors



■ **Recommended courses** : Circuit Theory, Electronic Circuits, Analog Electronic Circuits, Analog Integrated Circuits, Power Electronics, Digital Circuits

■ **Careers after graduation** : Samsung, LG, SK-Hynix, Research Institute, Silicon-Valley Companies, University

Introduction to our laboratory

A young and active research environment featuring horizontal peer relationships, 24-hour academic discussions, ample opportunities to attend international conferences, and a refreshed and clean office space.

Lab. Photo



International Conference



Winter Lab Workshop



Students' office room

Recent research achievements (2020~2025)

- Conference Presentations: (top) ISSCC 13편, (top-tier) VLSI Symposium 16편, (major) CICC 4편, (major) ESSCIRC 1편
- Journal Publication: IEEE JSSC 14편, IEEE TPEL 1편, IEEE TIE 1편, IEEE SSC-L 5편, IEEE SSC-M 1편
- Awards: 반도체설계대전 국무총리상('22), 삼성휴먼테크 동상('22)/은상('21), 삼성디스플레이논문대회 금상('24/'22/'21)