<Professor Jaeil Baek's Lab.>

■ **Contact information**

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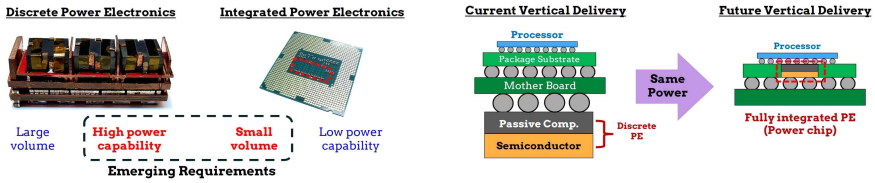
■ **Current state of the Lab. (in 2025 Spring Semester)**

Master's Student: 2 Undergraduate student : 7

■ **Research Areas: High Performance Integrated Power Electronics**



Our research group is focused on innovations for high performance integrated power electronics. Traditional discrete power electronics can provide high power capability but limited by its large volume. On the other hand, PMIC and integrated power electronics are very small but limited by its low power capability. The main research area of our group is about how to develop smarter, greener, smaller, and higher-power integrated power electronics (or power chips) for emerging and future applications. The following are some of the key research areas we are primarily interested in:

☐ **Building Block**

✓ Circuit element: Magnetics

✓ Function blocks: Circuit & Control

☐ **Architecture**

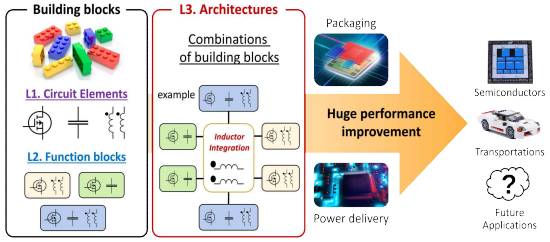
✓ Innovative combinations of building blocks

☐ **Packaging & Power Delivery**

☐ **Emerging & Future Applications**

✓ AI Semiconductors, Robot, Transportation, etc.

➢ Three levels of sophistication + Packaging & Power delivery



■ **Recommended courses & Career after graduation**

• **Recommended Courses**

Circuit theory, Electronics circuits, Power electronics

• **Career after graduation**

Academia, Industry, National lab

■ **Introduction to other activities besides research**

We hold seasonal workshops in both summer and winter. Our members actively participate in various sports such as running and soccer. We maintain a warm, respectful, and collaborative lab environment.

■ **Introduction to the Lab.**

We are looking for self-motivated students! Are you interested in power and energy crisis we are facing these days? Would you like to do lab activities more than just computer simulation? We are waiting for you!

■ **Recent research achievements ('22~'24)**

[1] Vertical Stacked LEGO-PoL CPU Voltage Regulator, **IEEE TPEL 2022 (First Prize Paper)**.

[2] MIPS: Multiphase Integrated Planar Symmetric Coupled Inductor for Ultrathin VRM, **IEEE TPEL 2023**.

[3] CoaxMIL 2.0 – Next Generation Coaxial Magnetic Integrated Inductors for Higher Efficiency Fully Integrated Voltage Regulator, **IEEE ECTC 2024**.