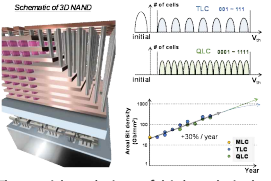
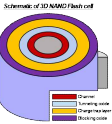
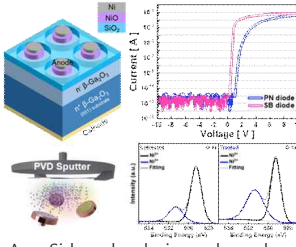
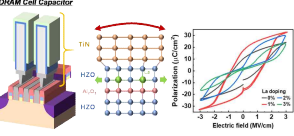
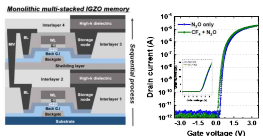
 <h1>NAND</h1> <p>Nanoelectronic And Neuromorphic Device Lab</p>	■ Contact information Professor : Cho, Byung Jin TEL : 042-350-3485 Lab. : jsbaek1121@kaist.ac.kr TEL : 042-350-5485 Website : https://nand.kaist.ac.kr/
■ Current state of the Lab. (in 2025 Spring Semester) Postdoctoral Fellows : 0 PhD Students: 10 Master's Student: 9 Visiting Researcher: 2	
■ Research Areas <div><div><h3>3D NAND Flash</h3><p>The rapid evolution of high-tech industry, including artificial intelligence, big data, autonomous driving, and cloud computing, is anticipated to drive a consistent demand for memory semiconductors, especially for 3D NAND technology.</p><ul style="list-style-type: none">*** New channel material<ul style="list-style-type: none">IGZO, HfC, multi-channels (IGZO, etc.)→ grain-size engineering, mobility enhancement, controlled V_{th} variation*** New charge-trap layer material<ul style="list-style-type: none">IGZO-based multilayered trapping layer→ EOT reduction, high trapping efficiency*** New blocking layer material<ul style="list-style-type: none">NiO₂-based / ferro- or anti-ferromagnetic materials→ PB performance enhancement by resistance recording<p>To maintain a leading position in the ever-competitive arena of 3D NAND technology, our laboratory actively has been researching for the next-generation charge trap flash (CTF) technology. This research area includes high-mobility channel materials, low-k interlayer dielectric (ILD), novel charge trap layer (CTL), new blocking layer and innovative cell structure.</p></div><div><h3>WBG Oxide semiconductor device (Power Device , Photo-detector)</h3><p>As Si-based devices has been facing various limitations, oxide semiconductors which can change the game of the semiconductor industry are emerging. Nickel oxide and Gallium oxide, which are type of oxide semiconductors featuring wide bandgap (WBG) characteristics, are getting attention as advanced channel materials for power devices, specifically diode, due to their capability of withstanding ultra-high voltage/current. In addition, oxide semiconductors can be used as optical devices (photo-detector) for detecting UV light with excellent photo-responsivity. Our laboratory are actively working on fabricating and developing power device and photo-detector based on WBG oxide semiconductor.</p></div><div><h3>DRAM</h3><p>Performance improvement of DRAM cell capacitor with conventional materials has reached its limit and people are seeking for new materials with high-k value and better leakage characteristic. Our research group is studying various methods to achieve the better performances utilizing ALD-Hf_{0.5}Zr_{0.5}O₂ dielectrics for superior DRAM cell capacitor.</p><p>At the same time, to lead the low-power and high density 3D DRAM, we are researching the possibility of Monolithic multi stacked 3D DRAM with oxide semiconductor (e.g. IGZO) for the new channel material.</p></div></div>	
■ Recommended courses & Career after graduation <p>Our lab strongly recommends freshmen to take following courses: [EE211] Introduction to Physical Electronics, [EE362] Semiconductor Devices, [EE463] Semiconductor IC Technology, and so on. After graduation, graduates start their careers in domestic or foreign semiconductor companies (Samsung Electronics, SK Hynix, Lam Research, etc), research institutes, universities, and so on.</p>	
■ Introduction to other activities besides research <p>We regularly engage in sports activities such as futsal and badminton every week, and we actively interact with other labs. We hold events such as workshop, homecoming, and MT (membership training) every year.</p>	
■ Introduction to the Lab. <p>Our lab has world-class experience and various know-hows on traditional memory devices (NAND and DRAM) and advanced semiconductor devices (Monolithic 3D integration and Oxide semiconductor based devices). Currently we are running 7 main projects funded by Samsung, government agencies. Our research group published 309 journals and presented in 368 conferences. Professor thoroughly guides our research with his deep understanding on CMOS technology. Our lab has open and friendly atmosphere that students make interactive discussion about their research.</p>	
■ Recent research achievements ('24~'25) <p>Major International Conference (IEDM 1 & VLSI 1) 14 SCI papers, 20 conference presentations, 25 patents</p>	