SUGAHARA LAB.

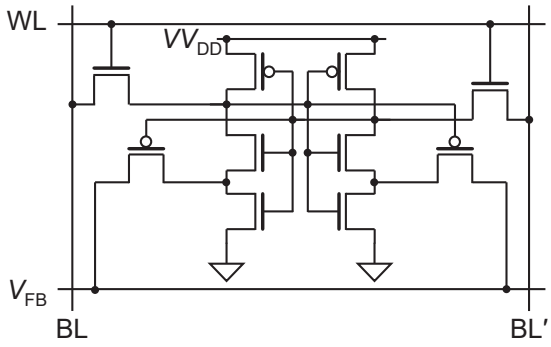
Mobile-Edge AI Accelerator and Integrated Electronics Technologies

FIRST, Imaging Science and Engineering Research Center

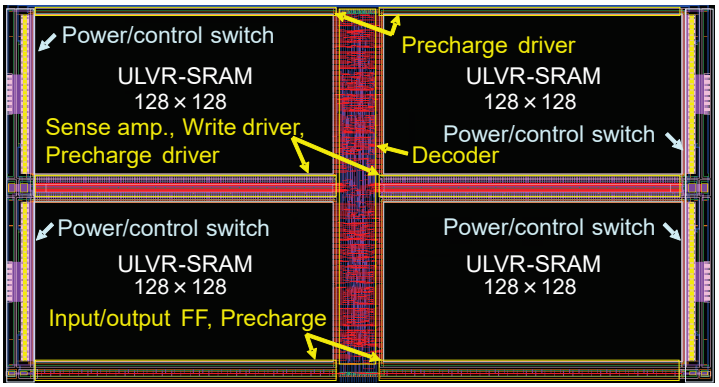
● Ultralow-voltage-retention and energy-minimum-point (EMP) operation SRAM

■ULVR-SRAM cell

- Power gating using ultralow-voltage retention (0.2V)
- Energy-efficient SRAM operation at EMP (0.4V)
- High-performance SRAM operation at normal voltage(1.2V)

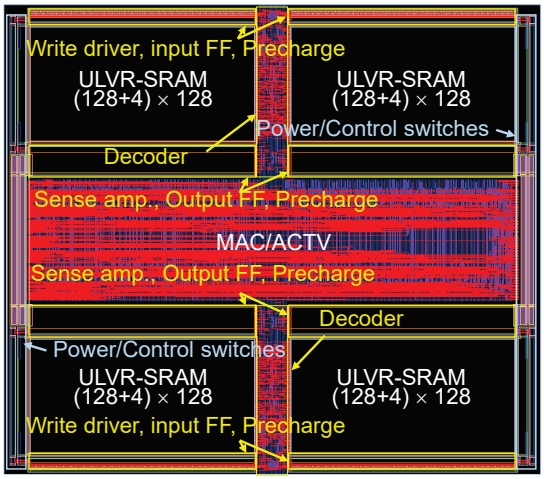


■8kB ULVR-SRAM macro



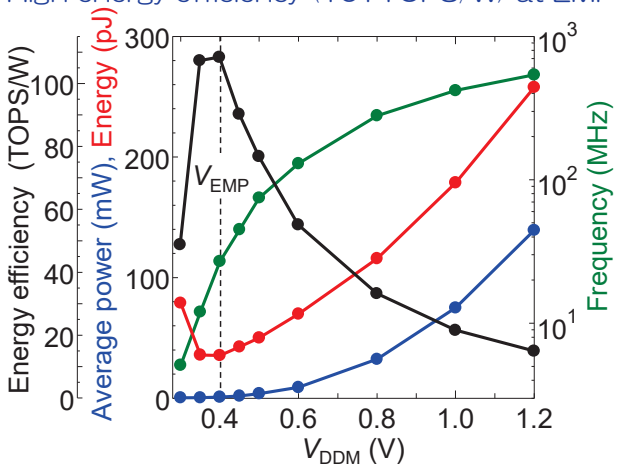
● Parallelized Processing-in-memory (PIM)-type AI accelerator for EMP operation

■8kB parallelized PIM-type AI accelerator macro



■ Performances

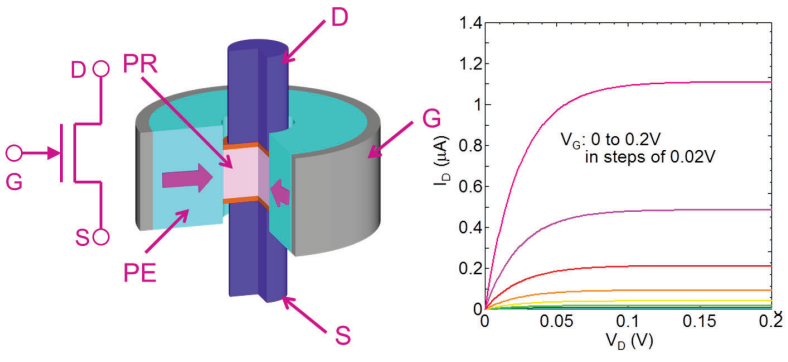
- High energy efficiency (107TOPS/W) at EMP (0.4V)



●Beyond-CMOS devices

■Piezoelectronic transistor(PET)

- Ultralow-voltage high-speed operation



●Micro TEG using body heat