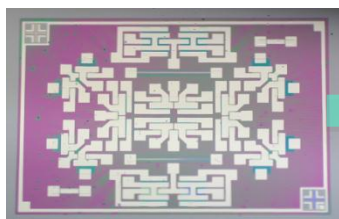


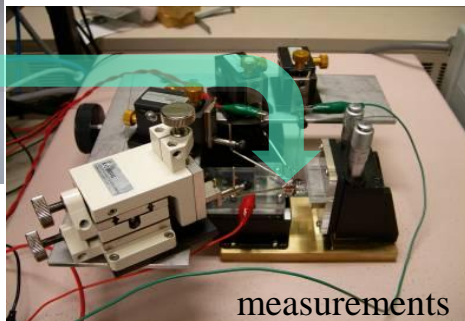
Ultra-Low Voltage Subthreshold LSI System and MOSFET based Sensors

Assistant Professor Tomochika Harada

Active Strain Sensor using SOI-MOSFET



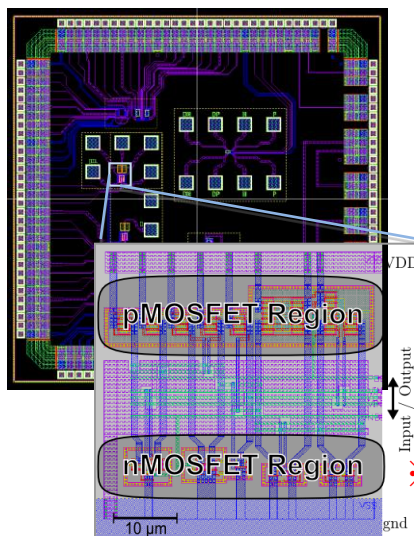
Sensor chip



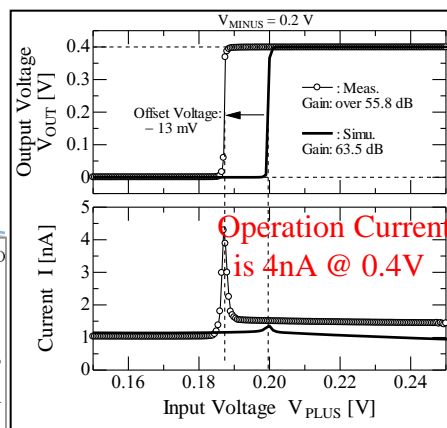
measurements

Ultra-Low Voltage Integrated Circuit

Circuit Layout



Operation at 0.4V power supply



✧ This circuit realizes a Rail-to-Rail operation at 0.4V power supply.

Content :

LSIs (Large Scale IC) are necessary for our life because these devices are built in any electronics systems, such as mobile phone, personal computer, car, and etc. However, power consumption of LSI systems is very important. If a power consumption realizes very low, they can achieve long term and no heating operation (more than 1 year and no heat sink) using battery or limited-power supply unit. Thus, I'm now studying two research topics.

(1) Ultra-Low Voltage Analog/Digital Integrated Circuits using Subthreshold Region (nano-order ampere region)

Using subthreshold Region, power consumption is reduced by one tenth or more. So, I'm now studying on the achievement of a ultra-low voltage circuit design technology, measurement method, and their applications.

(2) MOSFET based Semiconductor Sensor using MEMS Technology

If all sensors are replaced by MOSFET based structures, it is possible to fabricate with signal processing CMOS circuits using conventional LSI fabrication technology.

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Research Interest : Intelligent Integrated Circuit,
LSI design, MEMS sensor

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