



**Wednesday
May 10th , 2017**

1:30pm – 2:30pm,
Purdue Village
Community Center
Room 123
50 Nimitz Road
(west side of Birck)

Professor Masaharu Kobayashi Seminar

Technology break-through by ferroelectric HfO₂ for ultralow power electronics

Abstract: Cyber Physical System (CPS) is a key platform for business. In CPS, Internet-of-Things (IoT) device plays an important role to collect tremendous amount of data as a sensor node device. IoT device is expected to operate at less than 1uW so that power can be supplied by energy harvester from ambient. In order to achieve 1uW operation, current sensor node device requires more than 10x lower power consumption.

To tackle this challenge, new ultralow power device should be explored. Steep slope transistor and nonvolatile memory are key enablers for ultralow power IoT device. In this talk, recent studies on negative capacitance FET (NCFET) and ferroelectric based nonvolatile memory will be overviewed.

Both device technologies are based on CMOS-compatible ferroelectric HfO₂ discovered very recently. Material perspective of ferroelectric

HfO₂ will be also covered.