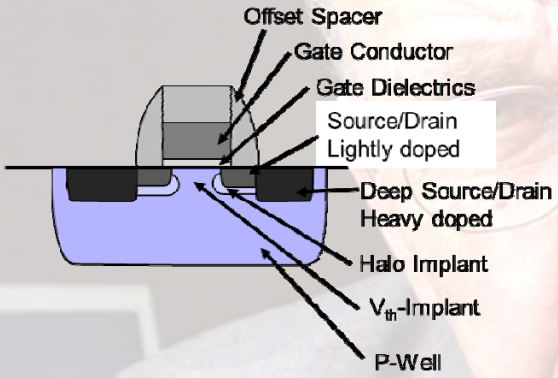
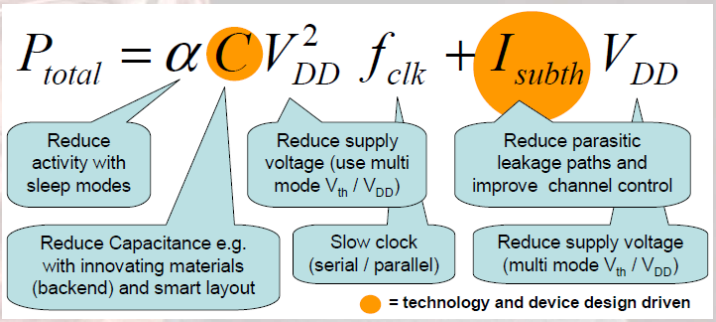
Design of integrated circuits

Department of Applied Sciences and Mechatronics (FK06)

HOCHSCHULE FÜR ANGEWANDTE WISSENSCHAFTEN MÜNCHEN



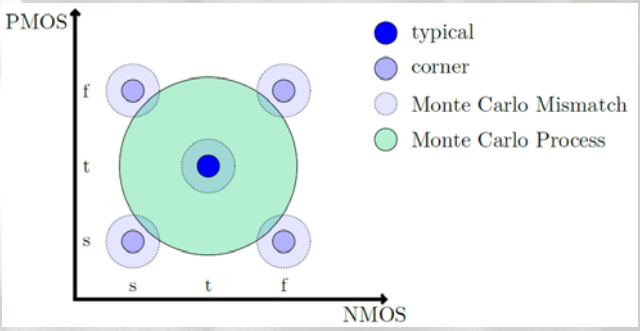
Typical modern planar transistor: Electrical X-section



Various power reduction measures for integrated circuits

Part I: Integrated digital circuits in deep submicron technologies

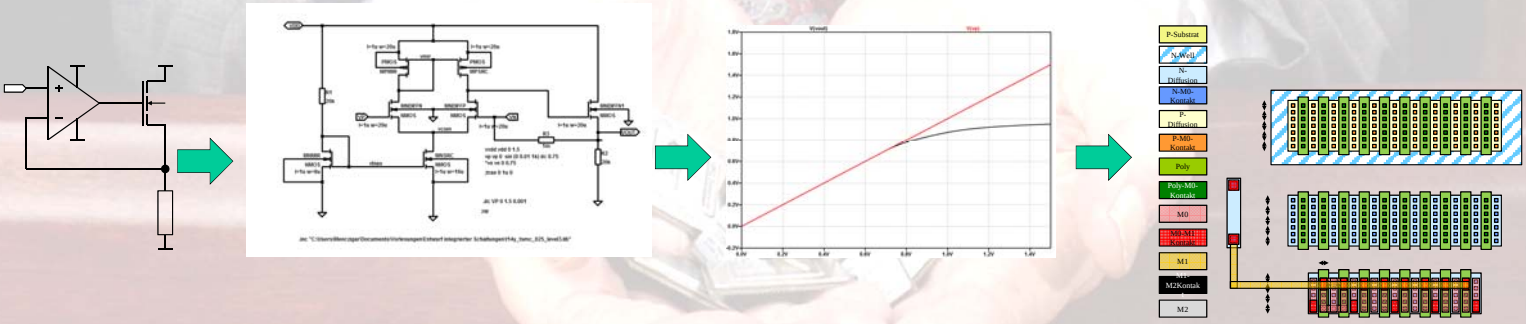
- The MOSFET (a refresher), the FINFET.
- Full custom design versus semi custom design.
- Basic digital building blocks and their key performance indicators within a technology node.
- Lithography and OPC (Optical Proximity Correction), layout.
- Leakage mechanisms and low power design.
- Design for manufacturing: 6 sigma design and verification strategies.
- Device reliability and integrated circuits durability.



Graphical representation of corner simulation and Monte Carlo circuit verification.

Part II: Integrated analog circuits and simulation examples

- Single stage amplifier (common source circuit, source follower)
- Differential amplifier (with passive resp. with active load)
- Frequency behavior of amplifiers (single stage amplifier and differential amplifier)
- Single stage and dual stage operational amplifiers
- Design and layout of a dual stage operational amplifier (Miller-OTA)
- Matching constraints in design and layout of operational amplifiers



Concept Design Simulation Layout

Prof. Dr. Helmut Fischer

Prof. Dr. Ullrich Menczigar

It's true that the original idea was mine, but what you see today is the work of probably tens of thousands of the world's best engineers."
Jack Kilby, Nobel laureate
Inventor of the ***integrated circuit***