

Experiment - 1

Aim - To study NMOS characteristics, introduction to VLSI & symica IDE

Theory - VLSI stands for Very large scale integration, a process of creating an integrated circuit by combining millions of transistor into a single chip. Before VLSI, ICs had a limited functionality. Early VLSI, seventies marks the growth of transistor count to about 1000 per chip. Since then the number of transistor on a single chip. Since then, the number of transistor on a single chip are increasing continuously. The revolution was pushed forward with introduction to microprocessor.

VLSI Design flow

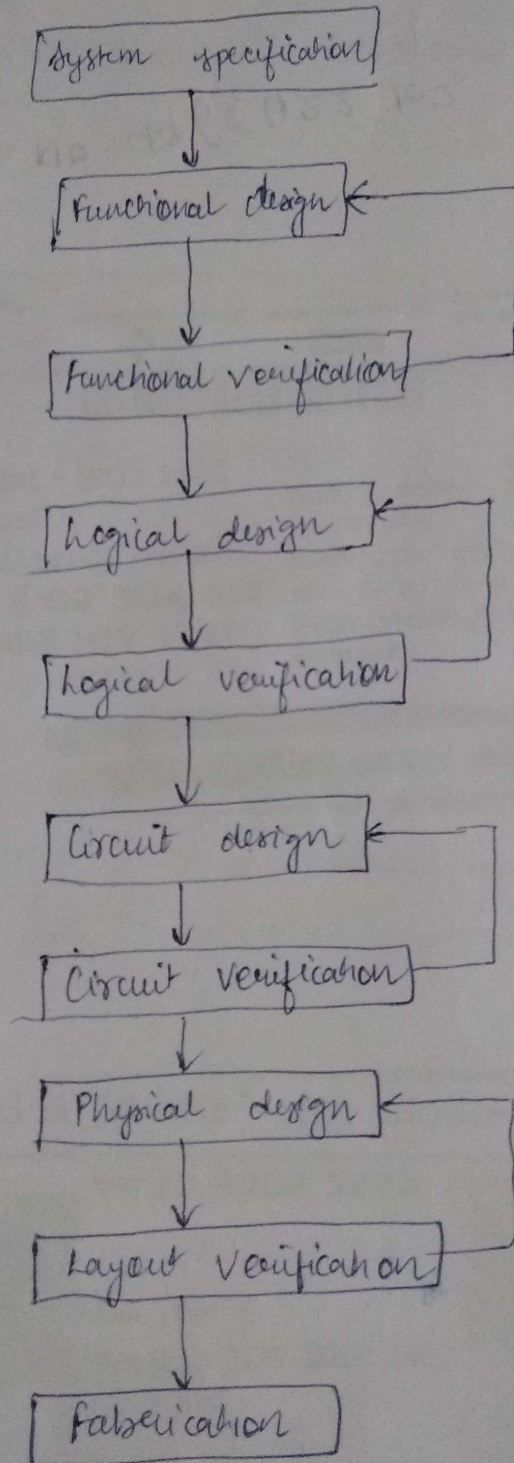
It starts with formal specification of VLSI chip, follows a series of steps and eventually produced a packaged chip. A typical design flow, cycle may be represented by flow chart.

System specification

It is a high level representation of system. The factor to be considered are performance, functionality and physical dimension, fabrication and design techniques.

architectural design

This includes decision of RISC vs CISC no. of alu floating point units, number and structure of pipelines



VLSI design flow

logic design

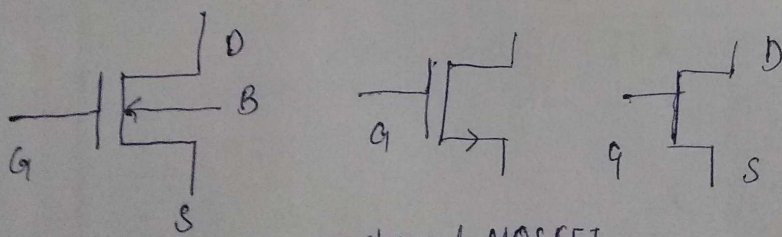
Control flow, word width, register allocation arithmetic operation and logic operation of the design that represent the functional design are derived the description is called register transfer level and is expressed in HDL such as VHDL/Veclilog

Circuit design

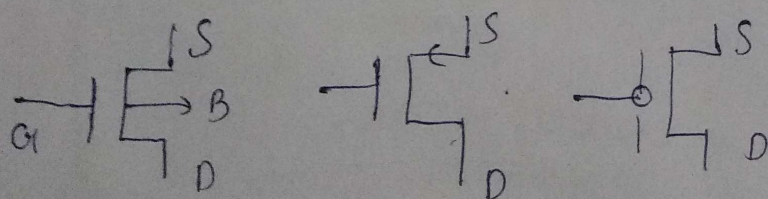
It develops a circuit representation based on logic design. The boolean expression are converted into circuit representations by speed power.

Physical design

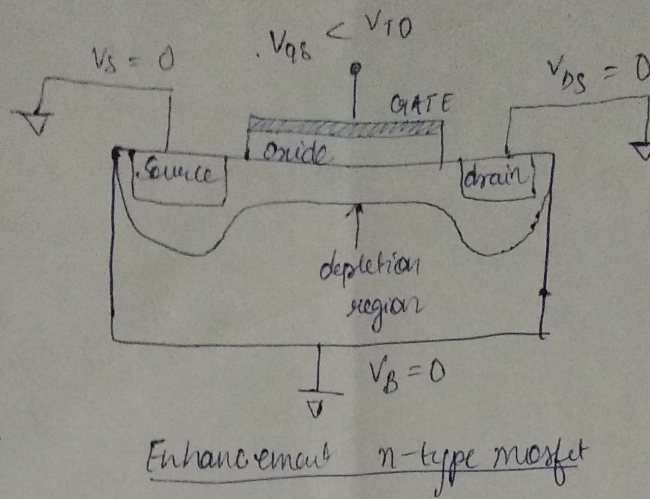
Circuit representation is converted to a geometric representation w/c is called layout. It is created by converting each logic component into geometric representation



n channel MOSFET



p channel MOSFET



Symula DE

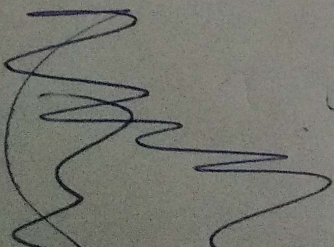
It is a software suite which makes designing easy & accurate. It includes various tools including schematic editor, waveform viewer and analyzer. It provides complete ecosystem for designing & developing.

Features —

- ① Hierarchical navigation
- ② Commonly used design structure, organised around libraries, cells
- ③ Flexible simulation environment
- ④ Powerful waveform viewer

Result

We studied basis of MOSFET, VLSI and Symula IDE



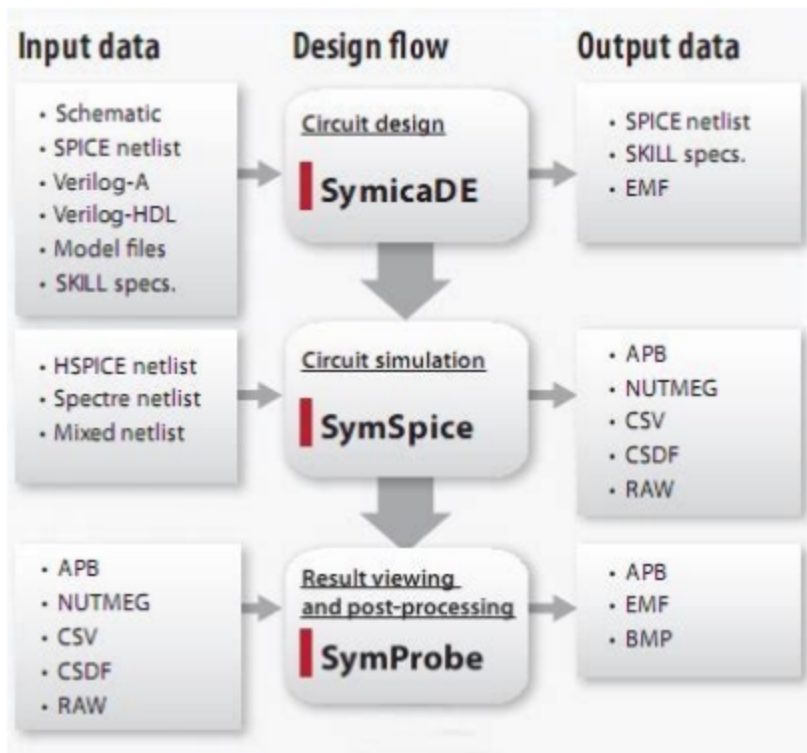


Figure 1: Symica DE Design Flow