

Integrated Circuits and Systems

List of requirements for 1st test

1. True tables of logic functions: NOT, AND, NAND, OR, NOR, AOI, OAI.
2. Principle of operation and schematics of gates: NOT, NAND, NOR, and transmission gate implemented in CMOS technology (schematics with 4-terminal MOS transistors).
3. Principle of operation and schematics of flip-flops implemented in CMOS (also schematics with transmission gates).
4. Declaration of constant and impulse voltage sources in SPICE.
5. Declaration of DC and TRANSIENT analyses in SPICE.
6. Declaration of MOS transistor in SPICE.
7. Logic gate parameters: delay (propagation) times (t_p , t_{PLH} , t_{PHL}), edge rising time t_r , edge falling time t_f , noise margins, threshold voltage of CMOS inverter and transient characteristic of CMOS gates.
8. Structure (cross-section) of NMOS and PMOS transistors.
9. Principle of operation, parameters and characteristics of NMOS and PMOS transistors.