

Note: (1) Bring a calculator. (2) Pay attention to units and the order of magnitude.

1. A calculation problem: solving the currents and voltage “everywhere” in a single bipolar transistor amplifier (either dc or ac)
2. Another real-number calculation problem: solving the dc voltage and current “everywhere” in a MOSFET circuit
3. MOSFETs. Note the definition of n-MOS, p-MOS, the enhancement type and the depletion type. The operation principle and the definition/expression of “triode” and “saturation” regions. Several typical, simple yet important circuit applications are reviewed in chapter 5.
4. CMOS inverter. Definition, graphics solution, the transfer relation, the definition of logic “HIGH” and “LOW” in terms voltages. Static versus dynamic operation. Delay. Dissipation.
5. MOS analog switch, transmission gate, the operation range and the circuit diagram
6. High frequency limit of a MOS.
7. The basic building block of an oscillator.
8. CMOS logic gates have a basic design scheme, the PUN and PDN. Draw a circuit diagram using p-MOS and n-MOS to implement any logic gate.
9. What do you use to measure the time delay of a logic gate?
10. Memory cells, SRAM, DRAM, and EEPROM. The basics and possible calculation involved. The sensing circuit. The equalization/precharge circuit.