



AAST
Faculty of Engineering
CE-Department
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Fifth Term
EC233: Devices II
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1. Calculate the maximum operating frequency for a Schottky diode whose capacitance is 2.0 pF and series resistance 1.0 Ω .
2. A Schottky diode is formed by depositing a thin film of gold onto a surface of clean n-type 1.0 $\Omega \cdot \text{cm}$ silicon. If the work function of the gold is 4.8 eV and that of silicon is 4.2 eV, calculate the height of the potential barrier preventing the electron in the conduction band of the semiconductor from entering the metal under equilibrium.
3. Determine the current density in an Al/n-Si Schottky diode at 0.4 v forward bias at 300°K. Assume a Richardson constant of 264 A/cm²·°k².
4. Draw the energy band diagram for a metal/p-type semiconductor contact in thermal equilibrium, before and after an intimate contact is made.