Essentials of MOSFETs

Lecture 4.2: Landauer at Low and High Bias

Short Problem

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From the mobility of a semiconductor, we can deduce the mean-free-path for backscattering. Answer the following questions.

1a) The electron mobility in pure silicon at room temperature is about 1360 cm^2/V-s. What is the MFP? (The appropriate effective mass to use in this case is the conductivity effective mass, $m^* = 0.26m_0$.)

1b) The electron mobility in pure gallium arsneide at room temperature is about 8200 cm^2/V-s. What is the MFP? (The appropriate effective mass to use in this case is $m^* = 0.066m_0$.)