

ECE 656: Fall 2009
Lecture 15 Homework

In Lecture 15, we showed that the Seebeck coefficient for a non-degenerate semiconductor with parabolic energy bands.

$$S_0 = \frac{k_B}{(-q)} \left\{ \left(\frac{E_C - F_n}{k_B T} \right) + \frac{3 \langle E^2 \tau \rangle}{2 \langle E \rangle \langle E \tau \rangle} \right\}$$

- 1) Work out the result assuming a constant scattering time.

- 2) Work out the result assuming a constant mean-free-path.