Fundamentals of Nanoelectronics, I: The New Perspective

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L1.4 Quiz

Answers

1.4. Conductance Formula

1.4a. In obtaining the expression for the conductance

$$\frac{I}{V} = \int_{-\infty}^{+\infty} dE\, G(E) \left(-\frac{\partial f_0(E)}{\partial E} \right)$$

from the current expression $I = \frac{1}{q} \int_{-\infty}^{+\infty} dE\, G(E) \left(f_1(E) - f_2(E) \right)$

the key assumption is that

(a) the applied voltage V is much less than kT

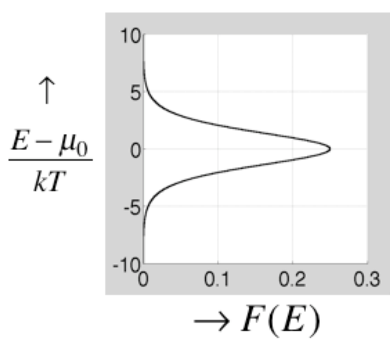
(b) the applied voltage V is much less than kT / q

(c) the applied voltage V is much greater than kT / q

(d) the applied voltage V is much less than the bandgap

(e) none of the above

1.4b. The function F(E) shown here is



(a) the Fermi function, $f_0(E)$

(b) $1 - f_0(E)$

(c) $1 + f_0(E)$

(d) $kT\, \partial f_0 / \partial E$

(e) $-kT\, \partial f_0 / \partial E$