

26. We use  $J = \sigma E = (n_+ + n_-)ev_d$ , which combines Eq. 27-13 and Eq. 27-7.

(a) The drift velocity is

$$v_d = \frac{\sigma E}{(n_+ + n_-)e} = \frac{(2.70 \times 10^{-14} / \Omega \cdot \text{m})(120 \text{ V/m})}{[(620 + 550) / \text{cm}^3](1.60 \times 10^{-19} \text{ C})} = 1.73 \text{ cm/s} .$$

(b)  $J = \sigma E = (2.70 \times 10^{-14} / \Omega \cdot \text{m})(120 \text{ V/m}) = 3.24 \times 10^{-12} \text{ A/m}^2$ .