

63. Using $A = \pi r^2$ with $r = 5 \times 10^{-4}$ m with Eq. 27-5 yields

$$|\vec{J}| = \frac{i}{A} = 2.5 \times 10^6 \text{ A/m}^2 .$$

Then, with $|\vec{E}| = 5.3 \text{ V/m}$, Eq. 27-10 leads to

$$\rho = \frac{5.3 \text{ V/m}}{2.5 \times 10^6 \text{ A/m}^2} = 2.1 \times 10^{-6} \text{ } \Omega \cdot \text{m} .$$