7.30 Repeat Problem 7.29 at 10 MHz.

Solution:

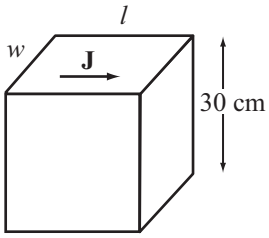

Figure P7.30 Copper block of Problem 7.30.

$$\text{d-c resistance } R_{\text{dc}} = \frac{l}{\sigma A} = \frac{l}{0.3\,\sigma w},$$

$$\text{a-c resistance } R_{\text{ac}} = \frac{l}{\sigma w \delta_{\text{s}}}.$$

$$\frac{R_{\text{ac}}}{R_{\text{dc}}} = \frac{0.3}{\delta_{\text{s}}} = 0.3\sqrt{\pi f \mu \sigma} = 0.3[\pi \times 10^7 \times 4\pi \times 10^{-7} \times 5.8 \times 10^7]^{1/2}$$

$$= 1.44 \times 10^4.$$