

Answer to Electromagnetism Example Question 14

We have that

$$B_o = \mu_o H_o = \frac{E_o}{c}$$
$$\therefore H_o = \frac{E_o}{\mu_o c} = \frac{1.5 \times 10^{-3}}{4\pi \times 10^{-7} \times 3 \times 10^8} = \underline{\underline{4.0 \times 10^{-6} \text{ Am}^{-1}}}$$

We have that

$$S_{ave} = \frac{E_o H_o}{2} \left(= \frac{1}{2} \frac{E_o^2}{\mu_o c} \right)$$
$$\therefore S_{ave} = \frac{1.5 \times 10^{-3} \times 4.0 \times 10^{-6}}{2} = \underline{\underline{3.0 \times 10^{-9} \text{ Wm}^{-2}}}$$