22-7 | If an EM wave has a frequency of 9.66 x 10^14 Hz, then we can get \( \lambda \) from
\[
\frac{c}{f} = \lambda = \frac{3.00 \times 10^8 \text{m/s}}{9.66 \times 10^{14} \text{s}^{-1}}
\]
Based on the chart on p. 620, this \( \lambda \) is in the ultraviolet.

22-38 | If the wave trains are 10^{-8}s in duration, then their spatial extent is
\[
\Delta x = v \Delta t = (3.00 \times 10^8 \text{m/s})(10^{-8}\text{s})
\]
\[
\Delta x = 3.00\text{m}
\]
What are \( E_0 \) and \( B_0 \) 200 m from a 95-W mono chromatic, isotropic light source.

\[
I = \frac{P}{A} = \frac{95 \text{ W}}{4\pi (200 \text{ m})^2} = 1.89 \text{ W/m}^2
\]

\[
\overline{I} = \frac{1}{\lambda} \varepsilon_0 c \frac{E_0^2}{\sqrt{\frac{2 \cdot 1.89 \text{ W/m}^2}{(8.85 \times 10^{-12} \text{ C}^2/\text{N}\cdot\text{m}^2)(3 \times 10^8 \text{ m/s})}}} = \overline{E_0} = 37.7 \frac{\text{N}}{\text{C}}
\]

\[
\overline{I} = \frac{1}{2} \frac{c}{\mu_0} B_0^2
\]

\[
\sqrt{\frac{2 \cdot 1.89 \text{ W/m}^2 (4\pi \times 10^7 \frac{\text{ T}}{\text{A}})^2}{3 \times 10^{8} \text{ m/s}}} = \overline{B_0} = 1.26 \times 10^{-7} \text{T}
\]