

Problem 2.15 Find α and Z_0 of a distortionless line whose $R' = 2 \text{ } \Omega/\text{m}$ and $G' = 2 \times 10^{-4} \text{ S/m}$.

Solution: From the equations given in Problem 2.13,

$$\alpha = \sqrt{R'G'} = [2 \times 2 \times 10^{-4}]^{1/2} = 2 \times 10^{-2} \text{ (Np/m)},$$

$$Z_0 = \sqrt{\frac{L'}{C'}} = \sqrt{\frac{R'}{G'}} = \left(\frac{2}{2 \times 10^{-4}} \right)^{1/2} = 100 \text{ } \Omega.$$
