

$$f = 88 \text{ MHz}$$

$$Z_0 = 75 \Omega$$

$$\beta = 4 \text{ rad/m}$$

$$l = 120 \text{ m}$$

$$t_{\text{ida y vuelta}} = 45 \text{ ns}$$

$$\beta = \omega \sqrt{LC}$$

$$4 = 2\pi(88 \times 10^6) \sqrt{LC}$$

$$\frac{4}{2\pi(88 \times 10^6)} = \sqrt{LC}$$

$$\frac{4}{150\pi(88 \times 10^6)} = \sqrt{C}$$

$$C = 9.64 \times 10^{-11} \text{ F/m}$$

$$75 = \sqrt{\frac{L}{C}}$$

$$75^2 \cdot C = L$$

$$L = 5625 (9.64 \times 10^{-11})$$

$$L = 0.54 \mu\text{H/m}$$

$$u = \frac{1}{\sqrt{LC}} = 1.38 \times 10^8 \text{ m/s}$$

$$V = \frac{x}{t} \Rightarrow x = V \cdot t = 1.38 \times 10^8 \cdot 22.5 \times 10^{-9}$$

$$x = 3.105 \text{ m}$$

2. La impedancia $Z_L = 53 + j70 \Omega$

$$\Gamma_L = \frac{Z_L - Z_0}{Z_L + Z_0} = \frac{53 + j70 - 50}{53 + j70 + 50} = \frac{3 + j70}{103 + j70} = \frac{70 \angle 87.5^\circ}{124 \angle 34^\circ} = 0.56 \angle 53.5^\circ$$

$$\text{SWR} = \frac{1 + |\Gamma_L|}{1 - |\Gamma_L|} = \frac{1 + 0.56}{1 - 0.56} \rightarrow \text{Era al revers} = 3.5$$

No se puede aceptar.

3. $f = 120 \text{ MHz}$
 $R = 20 \Omega/\text{m}$
 $L = 0.3 \text{ mH/m}$
 $C = 63 \text{ pF/m}$

$$\frac{R}{L} = \frac{G}{C} \Rightarrow G = \frac{RC}{L} = 4.2 \mu\text{S/m}$$

$$Z_0 = \sqrt{\frac{L}{C}} = 2182.1 \Omega$$

Impedancia caracteristica

$$u = \frac{1}{\sqrt{LC}} = 72.7 \times 10^5 \text{ m/s}$$

velocidad

$$\alpha = \sqrt{RG} = 9.1 \times 10^{-3}$$

$$\beta = \omega \sqrt{LC} = 103.6$$

$$\gamma = \alpha + j\beta = 9.1 \times 10^{-3} + j103.6 \text{ m}$$

$$b - V(x) = V_0 e^{-\alpha x}$$

$$0.2 V_0 = V_0 e^{-\alpha x}$$

$$0.2 = e^{-\alpha x}$$

$$\ln(0.2) = -\alpha x$$

$$x = -\frac{\ln(0.2)}{\alpha}$$

$$x = 176.8 \text{ m}$$