

Depto : INGENIERÍA EN ELECTRONICA  
 Materia : MEDIOS DE ENLACE  
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 Tema : \_\_\_\_\_ Legajo : \_\_\_\_\_ Fecha : 25/08/2014



$$3) \quad Z_s = Z_0 = \frac{Z_1}{2} + \frac{Z_2 \cdot \left( \frac{Z_1}{2} + Z_0 \right)}{Z_2 + \frac{Z_1}{2} + Z_0} = \frac{Z_1 Z_2 + \frac{Z_1^2}{2} + Z_1 Z_0 + \frac{Z_1 Z_2 + Z_1 Z_0}{2}}{(2Z_2 + Z_1 + 2Z_0)} =$$

$$Z_0 (2Z_2 + 2Z_0 + Z_1) = Z_1 Z_2 + \frac{Z_1^2}{2} + Z_1 Z_0 + Z_1 Z_2 + Z_1 Z_0$$

$$2Z_2 Z_0 + 2Z_0^2 + Z_0 Z_1 = Z_1 Z_2 + \frac{Z_1^2}{2} + Z_1 Z_0 + Z_1 Z_2 + 2Z_1 Z_0$$

$$2Z_2 Z_0 + 2Z_0^2 = 2Z_2 Z_1 + \frac{Z_1^2}{2} + 2Z_1 Z_0$$

$$\left( \begin{aligned} 2Z_0^2 &= 2Z_2 Z_1 + \frac{Z_1^2}{4} + 2Z_1 Z_0 - 2Z_2 Z_0 = 2Z_2 Z_1 + \frac{Z_1^2}{4} + Z_0(2Z_1 - 2Z_2) \\ Z_0^2 &= Z_2 Z_1 + \frac{Z_1^2}{8} + Z_0(Z_1 - Z_2) \end{aligned} \right)$$

$$2Z_0^2 = 2Z_2 Z_1 + \frac{Z_1^2}{2} \quad \checkmark$$

$$Z_0^2 = Z_2 Z_1 + \frac{Z_1^2}{4} \quad \checkmark$$

$$Z_0 = \sqrt{Z_2 Z_1 + \frac{Z_1^2}{4}} = \sqrt{Z_2 Z_1 \left( 1 + \frac{Z_1}{4Z_2} \right)} \quad \checkmark$$

$$\frac{Z_1}{Z_0} = \frac{4}{\sqrt{Z_0^2}} = \frac{4}{\sqrt{Z_2 Z_1 + \frac{Z_1^2}{4}}}$$