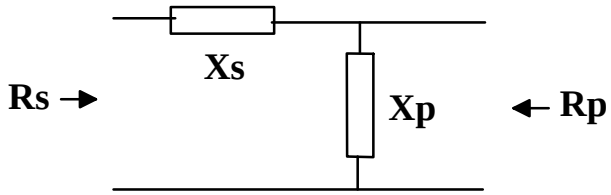
L Matching Network Design

Basic L network:



Design Procedure:

- Given a desired transformation $R1 \leftrightarrow R2$, equate the lowest resistance (call it R1) with the "series side" of the matching network. I.e. R1 = Rs and R2 = Rp.

- Compute the required q value from:

$$q = \sqrt{\frac{R_p}{R_s} - 1}$$

- Compute the series reactance from:*

$$X_s = \pm qR_s$$

- Compute the parallel reactance from:*

$$X_p = \mp \frac{1+q^2}{q^2} X_s = \mp \frac{R_p}{q}$$

- Convert to capacitance and inductance values using

$$L = \frac{X_L}{2\pi f} \quad \text{and} \quad C = \frac{1}{2\pi f X_c}$$

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* If one component is selected to be capacitive, then the other must be inductive. The choice of which type to use for a particular side of the network depends on other circuit design considerations. For example, the choice:

- will determine whether a "lowpass" or "highpass" response is present outside the primary matching frequency,
- may affect the bias circuit design, or
- may make it possible to save on the number of circuit components by careful combinations of the functions of components such as the matching capacitor and a required AC output coupling capacitor.