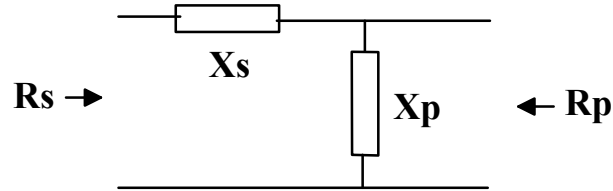


L Matching Network Design

Basic L network:



Design Procedure:

- ◆ Given a desired transformation $R_1 \leftrightarrow R_2$, equate the lowest resistance (call it R_1) with the "series side" of the matching network. I.e. $R_1 = R_s$ and $R_2 = R_p$.
- ◆ Compute the required q value from:

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

- ◆ Compute the series reactance from:*

$$X_s = \pm q R_s$$

- ◆ 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

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

* 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.