Collection of Impedance Matching Circuits

useful functions and identities
Units
Constants

Inputs

Load impedance
Source impedance
Lower edge of band frequency
Upper edge of band frequency
Desired Q of matching network

Calculations

Lowpass L

\[ x := \text{lowL}(Z_L, Z_S, f_{\text{min}}, f_{\text{max}}) \]

\[ L := x_1 \cdot \text{Henry} \quad L = 27.554 \text{nH} \]

\[ C := x_2 \cdot \text{Farad} \quad C = 0.658 \text{pF} \]

Bandpass L-L #2

\[ x := \text{band2LL}(f, Z_S, Z_L) \]

\[ C_S := x_1 \cdot \text{F} \quad C_S = 0.127 \text{pF} \]

\[ C_L := x_2 \cdot \text{F} \quad C_L = 2.346 \text{pF} \]

\[ L_S := x_3 \cdot \text{H} \quad L_S = 43.625 \text{nH} \]
\begin{align*}
L_L &:= x_4 H \\
L_L &:= 19.195 \text{nH} \\
\text{Bandpass L-L (or Pi)} &:= \text{bandpi}(f, Z_S, Z_L, Q) \\
C_S &:= x_1 F \\
C_S &:= 2.439 \text{pF} \\
L_S &:= x_2 H \\
L_S &:= 11.312 \text{nH} \\
C_L &:= x_3 F \\
C_L &:= 7.073 \text{pF} \\
L_L &:= x_4 H \\
L_L &:= 3.537 \text{nH} \\
\text{Bandpass L-L #1} &:= \text{band1LL}(f, Z_S, Z_L) \\
C_S &:= x_1 F \\
C_S &:= 0.717 \text{pF} \\
C_L &:= x_2 F \\
C_L &:= 1.629 \text{pF} \\
L_S &:= x_3 H \\
L_S &:= 36.011 \text{nH} \\
L_L &:= x_4 H \\
L_L &:= 13.33 \text{nH} \\
\text{Highpass L} &:= \text{highL}(Z_S, Z_L, f) \\
L &:= x_1 H \\
L &:= 22.344 \text{nH} \\
C &:= x_2 F \\
C &:= 1.135 \text{pF} \\
\text{Lowpass Pi} &:= \text{lowpi}(f, Z_S, Z_L, Q) \\
C_L &:= x_1 \text{farad} \\
C_L &:= 2.583i \text{pF} \\
C_S &:= x_2 \text{farad} \\
C_S &:= 0.29 \text{pF} \\
L &:= x_3 \text{henry} \\
L &:= 37.882 + 13.831i \text{nH} \\
\text{High Pass T} &:= \text{high}(f_{\text{min}}, f_{\text{max}}, Z_S, Z_L, Q) \\
C_L &:= x_1 \text{farad} \\
C_L &:= 1.768 \text{pF} \\
C_S &:= x_2 \text{farad} \\
C_S &:= -0.84 \text{pF} \\
L &:= x_3 \text{henry} \\
L &:= 19.788 \text{nH} \\
\text{Highpass L-L} &:= \text{highLL}(f, Z_S, Z_L) \\
C_S &:= x_1 F \\
C_S &:= 0.717 \text{pF} \\
L_S &:= x_2 H \\
L_S &:= 36.011 \text{nH} \\
C_L &:= x_3 F \\
C_L &:= 2.346 \text{pF} \\
L_L &:= x_4 H \\
L_L &:= 19.195 \text{nH} \\
\text{Highpass Pi} &:= \text{highpi}(Z_S, Z_L, Q_{\text{min}}, Q_{\text{max}}) \\
L_L &:= x_1 H \\
L_L &:= -12.109 \text{nH} \\
L_S &:= x_2 H \\
L_S &:= 30.331 \text{nH} \\
C &:= x_3 F \\
C &:= 0.728 - 0.266i \text{pF} \\
\end{align*}
Copyright Notice

All software and other materials included in this document are protected by copyright, and are owned or controlled by Circuit Sage.

The routines are protected by copyright as a collective work and/or compilation, pursuant to federal copyright laws, international conventions, and other copyright laws. Any reproduction, modification, publication, transmission, transfer, sale, distribution, performance, display or exploitation of any of the routines, whether in whole or in part, without the express written permission of Circuit Sage is prohibited.