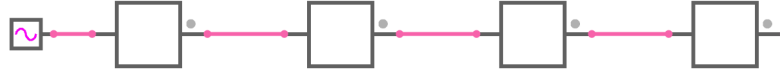


test_filter_8.sqproj

a0=0	a0=100	a0=1.0	a0=1.0
a1=5e8	a1=1.0	b0=1000	b0=1000
b0=20	b0=1000	b1=1.0	b1=1.0
b1=1.0	b1=1.0		



flag_asymptote = 1

set global parameter flag_asymptote to
 0 for actual plot
 1 for asymptotic plot
 Ref: Hayt and Kemmerly

Shown in the figure is a filter given by

$$H(s) = \frac{a_0^{(1)} + a_1^{(1)}s}{b_0^{(1)} + b_1^{(1)}s} \times \frac{a_0^{(2)} + a_1^{(2)}s}{b_0^{(2)} + b_1^{(2)}s} \times \frac{a_0^{(3)}s}{b_0^{(3)} + b_1^{(3)}s} \times \frac{a_0^{(4)}s}{b_0^{(4)} + b_1^{(4)}s}. \quad (1)$$

Exercise Set

1. With the coefficient values as specified in the figure, draw the asymptotic gain and phase plots (Bode plots) for the filter for $0.01 \text{ Hz} < f < 100 \text{ kHz}$. The frequency and gain axes should be logarithmic, and the phase axis should be linear.
2. Compare your plots with simulation results obtained by setting the global parameter `flag_asymptote` to 1.
 (Note that the output is equal to the transfer function since the filter input \mathbf{V}_i is set to $1\angle 0$.)
3. Compare the asymptotic plots with the actual gain and phase plots obtained by setting `flag_asymptote` to 0.