

EEE 202 CIRCUIT THEORY

LAB 5

Design a band-pass-filter with a center frequency, f_0 , in the range 1 to 6MHz for source and load resistances of 50Ω .

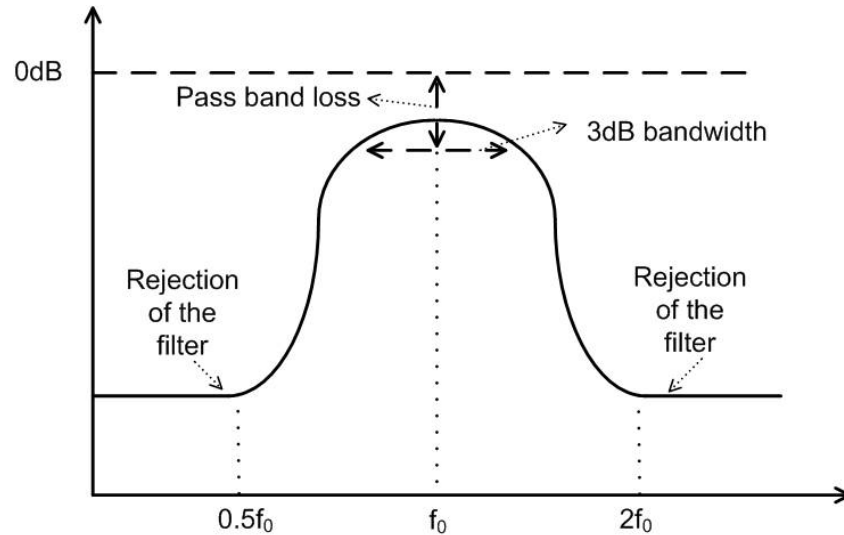


Figure 1: Filter Response

The 3-dB filter bandwidth should be equal to $0.05f_0$. The pass-band loss of the filter (the loss between the input of the filter and the output of the filter) should be less than 6 dB (additional 3 dB loss for non-ideal components). The rejection of the filter should be at least 30 dB for $0 < f < 0.5f_0$ and $2f_0 < f < 5f_0$.

Preliminary Work

Show your design steps. Verify your designed circuit using SPICE.

Experimental Work

Implement your circuit. Measure the transfer function of your filter for $0.05f_0 < f < 5f_0$. Plot the response on a log-log scale. Compare with your expected transfer function and explain any differences.

Available materials in the lab

Toroidal cores to design inductors or transformers: T25-10, T37-7, T38-8, T50-7 from Micrometals. There are standard values of capacitors and resistors available.