EEE 202 CIRCUIT THEORY
LAB 5

Design a band-pass filter with given specifications for 50Ω load resistance.

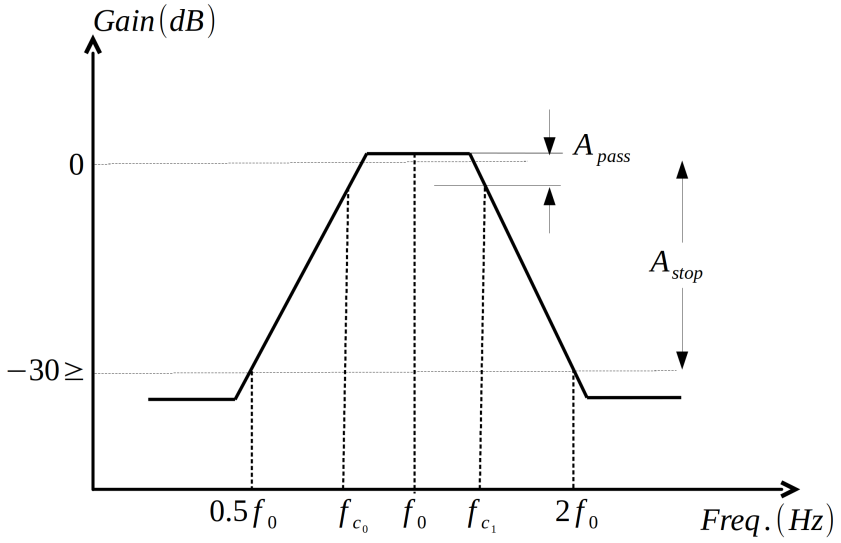

Figure 1: Frequency response of the filter

Central frequency: $3Mhz \leq f_0 \leq 6Mhz$
Passband width: $f_{c_1} - f_{c_0} = 0.05 f_0$
Gain variation in the passband: $A_{pass} \leq 3dB$
Stopband attenuation: $A_{stop} \geq 30dB$

Software lab

- Show all design steps (How did you decide the order and type of the filter? How did you use the given filter specifications in your design?).
- Generate frequency response plot, and confirm that your filter matches given specifications.

Hardware lab

- Build your band-pass filter.
- If you are using an LC network, your circuit components must match the resonance frequency. To be sure:
  - Build LC pairs step by step.
  - First select the capacitor and tune your inductor turn count until you achieve the desired gain at the chosen center frequency.
  - Repeat it as you add new LC pairs.
- Measure gain at 5 frequencies in the passband and 5 frequencies around both stop frequencies.
- Draw frequency response plot by using this data.

Available materials in the lab

Toroidal cores (T25-10, T37-7, T38-8, T50-7 from Micrometals), capacitors, inductors and OpAmps.