EECE-315 Prelab 13

1. Refer to the circuit shown in Fig. 1. The output current is the current leaves the collector. Calculate the open-loop and closed-loop transconductance midband gains. Also calculate the lower –3 dB cutoff frequencies with the feedback loop open and closed.

2. Refer to the circuit shown in Fig. 2. Calculate the open-loop and closed-loop transresistance midband gains.

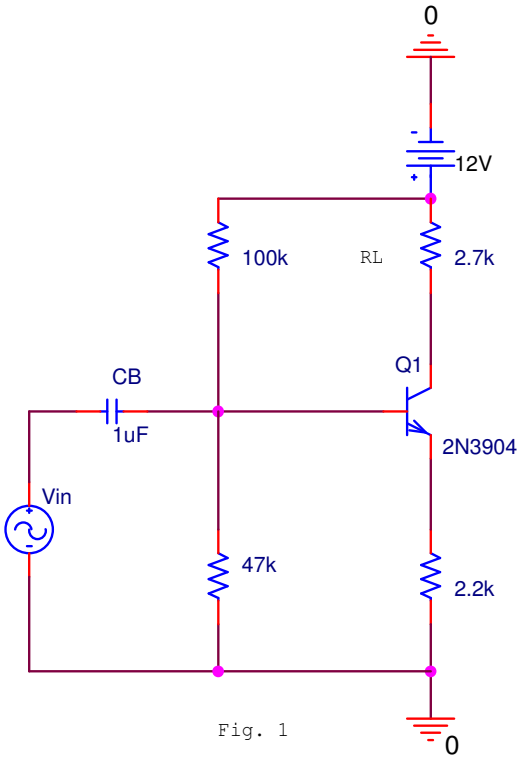

Fig. 1

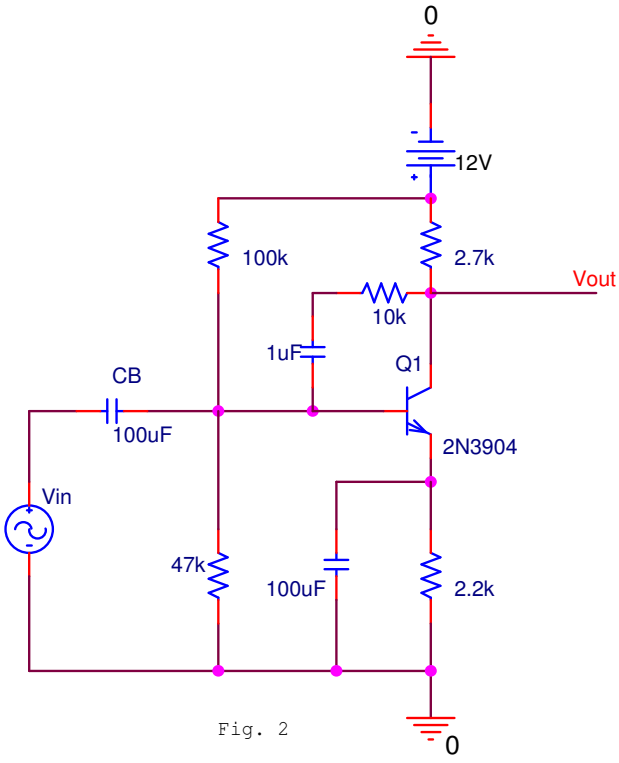

Fig. 2

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1. Build the circuit shown in Fig. 1 on the prelab. Measure the voltage gain (closed-loop gain) at 1 kHz, and determine the lower – 3dB cutoff frequency.

2. Connect an emitter bypass capacitor, C_E, of at least 1000 uF across R_E. Measure the voltage gain (open-loop gain) at 1 kHz, and determine the lower – 3 dB cutoff frequency.

3. Compare the open-loop and closed-loop transcondutance gains you measured to the theoretically calculated values.

4. Compare the lower –3 dB cutoff frequencies of this amplifier with the loop closed (without C_E) and open (with C_E).

4. Build the circuit shown in Fig. 2 on the prelab. Insert a decade resistance box (~ 10 kohms) between the input voltage source, V_{in}, and the input blocking capacitor, C_B. Use a differential mode to display the voltage across the decade resistance box. Dividing the voltage by the resistance gives the input current of the feedback amplifier. Measure the transresistance gain (closed-loop) at 1 kHz.

5. Remove the 10 kΩ from the circuit. Measure the transresistance gain (open-loop) at 1 kHz.

6. Compare the open-loop and closed-loop transresistance gains you measured to the theoretically calculated values.