

ELG3331

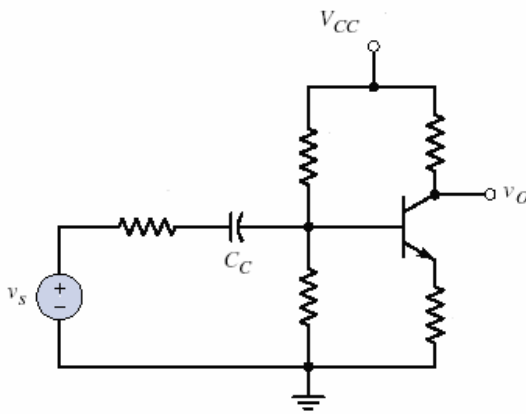
Lab 2: A BJT Common Emitter Amplifier

Objective: To understand the operation of BJT and common-emitter amplifier.

Theory: Study Section 10.2 of the textbook.

Equipment and Components:

- 2N3904 transistor
- DC power supply
- Oscilloscope
- Digital multimeter



Procedure:

- Connect the circuit given below and name the components.
- Chose proper values for the components C_C , R_1 and R_2 (possibly similar values to the ones given in the textbook, if available $50\text{ k}\Omega$ and $5.6\text{ k}\Omega$). You may choose $C_C=10\text{ }\mu\text{F}$. It is always good to have $I_C=1\text{ mA}$. Use $R_C = 1\text{ k}\Omega$.
- Use 1 kHz signal v_s with an amplitude that gives undistorted output signal v_o .
- V_{CC} might be 10 V or 12 V .
- Measure the gain of the amplifier (v_o/v_s) for different values of $R_E = 0, 500\text{ }\Omega$, and $1000\text{ }\Omega$.
- Measure V_{CE} .
- What will happen to the gain if we add a load $R_L = 2\text{ k}\Omega$.

Report:

- In the report state the function of each component in the amplifier circuit.
- Briefly describe the circuit and its objectives.
- Also, calculate the theoretical gain according to the selected component values. Assume $\beta = 150$ and $V_{BE} = 0.7\text{ V}$.
- Compare the theoretical and experimental results.