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LABORATORY REPORT

TRANSISTOR AMPLIFYING CIRCUIT

INTRODUCTORY SUMMARY&PURPOSE

1. Grasp the measuring method of the amplifying circuit static state working point and analyze the influence of the static state working point to the amplifier performance.

2. Grasp the measuring method of the amplifying circuit voltage amplification gain and the most greatly not distorted voltage.

3. Grasp the measuring method of the amplifying circuit input resistance and the output impedance.

EXPERIMENT EQUIPMENT

- a. Digital multimeter
- b. DC stabilized voltage power supply.
- c. Function signal generating device
- d. AC millivolt
- e. Double-trace oscilloscope

PREPARATION REQUIREMENTS

- a. Transistor amplifying circuit's principle of working.
- b. Amplifying circuit static state working point measuring and debugging.
- c. Research amplifying circuit's dynamic working principle.

LAB PROCEDURE

Step1

The measurement of the amplifying circuit static state working point.

- a. Judge triode's polarity and the quality with the multimeter.
- b. According to Figure 9.1 junction circuit, connect direct-current power supply, measure the voltage and calculate the voltage and current. Then fill them in the table 9.1

Step2

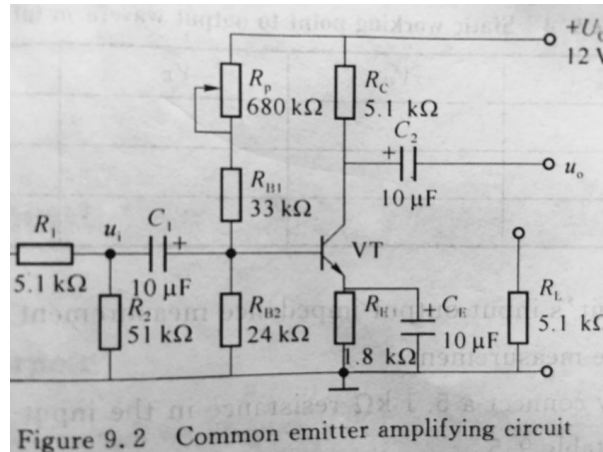
Dynamic research

- a. According to figure 9.2 junction circuit, adjust R_p to cause V_c to be equal to 6V.
- b. Adjust signal generator's output for the sinusoidal signal of $f = 1\text{kHz}$, $U_s = 500\text{mV}$, and connect to Figure 9.2 electric circuit's A spot, through R_1 R_2 attenuation 100 times, the signal which the U_i obtain 5mV, and observe U_i , U_o signal, pay attention to phase

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relation, and draw U_i U_o waveform.

- c. Maintain the signal generating device output signal frequency invariable, increase the signal scope gradually, observe the most greatly not distorted voltage U_p and fill in the table 9.2



Step3

Amplifying circuit's input-output impedance measurement

- a. Input resistance measurement.
- b. Output impedance measurement

PROBLEMS ENCOUNTERED

The errors form resistance precision and operation zero draft, zero temperature. From the beginning, our circuit is not very perfect, so we change it and we can measure it after then. Voltage-following circuit is roughly equal to U_o and error is small when the voltage is added to 3V, measurement value are not similar because of the amplifier itself. Use various mathematical

CONCLUSION

An op-amp is connected with strong negative feedback to ensure its operation in the linear region. Under this condition, op-amps are often used to construct various mathematical operation circuits, including multiplication with a constant gain, summing, subtraction, differentiator and integrator etc.

Put the measured static working point, voltage gain, input resistance, output resistance and calculated values to compare and analyse the causes of errors.

For the analysis method, you can take use of the features of virtual short and virtual open.

I will call you this week to go on discussing our experiment and study the project since there are still many potential areas related to this science topic. And any possible follow up you may wish us to do.

Sincerely,

Weiping Zhu