Feng Chia University

Electrical Engineering Fundamentals II Lab

Laboratory 9

BJT- Basic Characteristics and Biasing Circuits

Instructor: Prof. Shyan-Lung Lin

Student Name: 周嘉禾

Student ID: D1166506

Experiment Date:09/05/2024

I. Introduction

a. To observe the behavior of BJT Basic Characteristics and Biasing Circuits

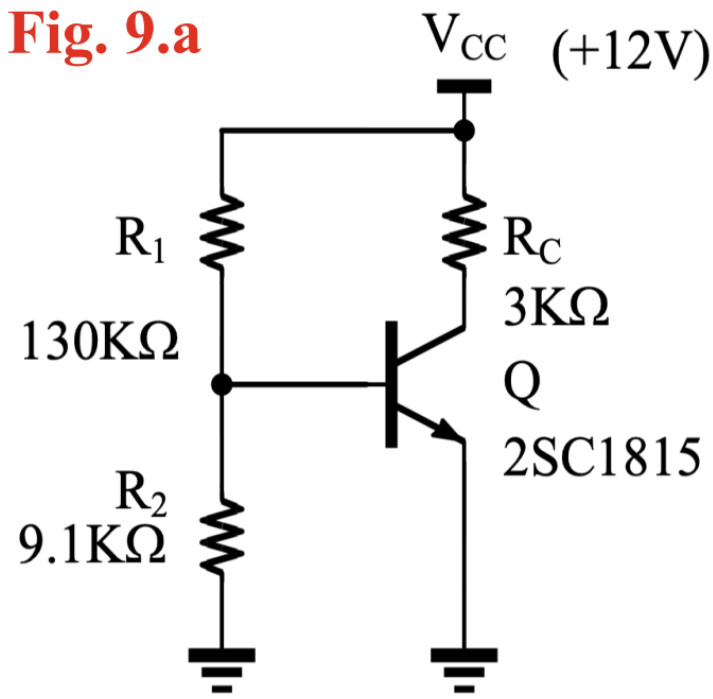
II. Materials

1. Power supply
2. Digital Multimeter
3. Devices

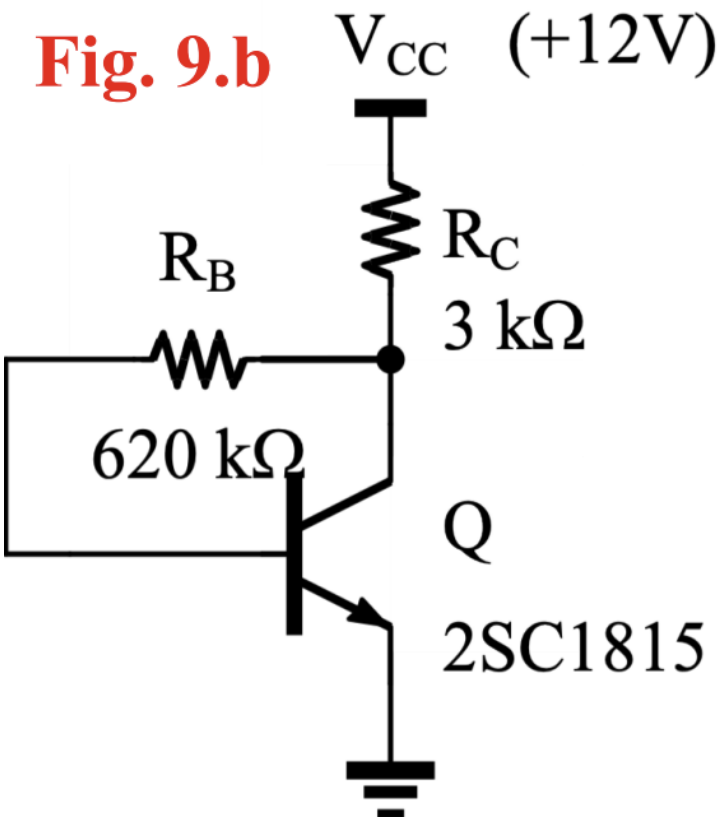
Q: 2SC1815 ×1, 2SC1384 ×1

Resistors: R = 1 kΩ ×1, 2.4 kΩ ×1, 3 kΩ ×1, 9.1 kΩ ×1, 15 kΩ ×1, 47 kΩ ×1, 130 kΩ ×1, 620 kΩ×1

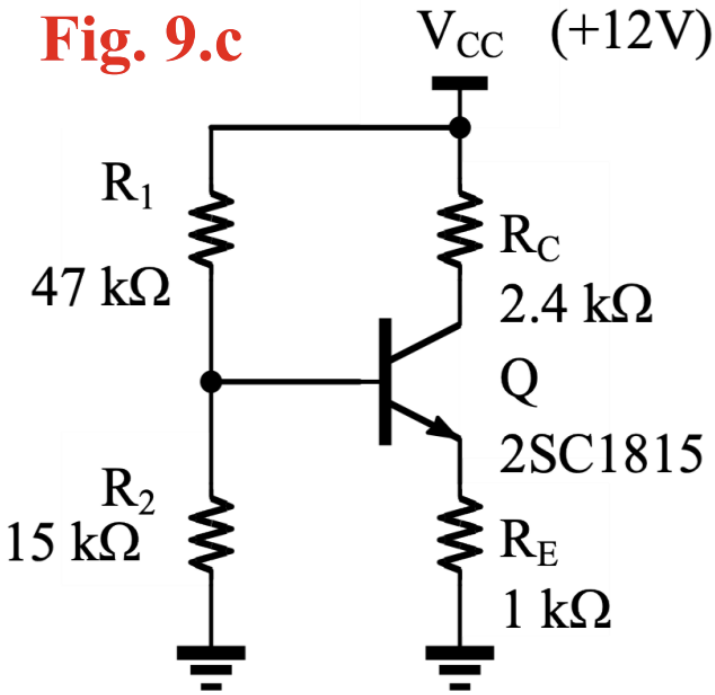
III. Circuit diagram



▲ Figure 1. Circuit of Experiment 9.a Fixing Bias



▲ Figure 2. Circuit of Experiment 9.b Collector-to-Base Feedback



▲ Figure 3. Circuit of Experiment 9.c Negative Feedback with Emitter Resistor

IV. Methods

Using Digital Multimeter to observe voltage and current.

V. Experiments data

1. Experiment 9.a Fixing Bias

Table 1: Measurement of BJT with Fixing Bias

Q	B	B Measure	I_C	I_B	V_{CB}	V_{BE}
1815	309	202.9340	3.9978 mA	0.0197 mA	-0.5148 V	0.6789 V
1384	221	156.4883	4.0061 mA	0.0256 mA	0.0721 V	0.0689 V

2. Experiment 9.b Collector-to-Base Feedback

Table 2: Measurement of Collector-to-Base Feedback

Q	B	B Measure	I_C	I_B	V_{CB}	V_{BE}
1815	309	240.2857	2.0184 mA	0.0084 mA	5.3802 V	0.6279 V
1384	221	198.1290	1.8426 mA	0.0093 mA	5.9146 V	0.6060 V

3. Experiment 9.c Negative Feedback with Emitter Resistor

Table 3: Measurement of Negative Feedback with Emitter Resistor

Q	B	B Measure	I_C	I_B	V_{CB}	V_{BE}
1815	309	295.4865	2.1866 mA	0.0074 mA	4.4462 V	0.6536 V
1384	221	186.2564	2.1792 mA	0.0117 mA	4.5018 V	0.6101 V

VI. Results

None

VII. Discussion

Different BJTs result in different B.

VIII. Conclusion

From the experimental data above, the BJT work in an ideal situation.