Feng Chia University

Electrical Engineering Fundamentals II Lab

Laboratory 9

BJT- Basic Characteristics and Biasing Circuits

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1. Introduction
2. To observe the behavior of BJT Basic Characteristics and Biasing Circuits
3. 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

1. Circuit diagram

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自動產生的描述

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

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

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自動產生的描述

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

1. Methods

Using Digital Multimeter to observe voltage and current.

1. Experiments data
   1. Experiment 9.a Fixing Bias

Table 1: Measurement of BJT with Fixing Bias

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q | B | B Measure | IC | IB | VCB | VBE |
| 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 |

* 1. Experiment 9.b Collector-to-Base Feedback

Table 2: Measurement of Collector-to-Base Feedback

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q | B | B Measure | IC | IB | VCB | VBE |
| 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 |

* 1. Experiment 9.c Negative Feedback with Emitter Resistor

Table 3: Measurement of Negative Feedback with Emitter Resistor

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q | B | B Measure | IC | IB | VCB | VBE |
| 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 |

1. Results

None

1. Discussion

Different BJTs result in different B.

1. Conclusion

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