**BASIC ELECTRONICS**

**EXPERIMENT 7**

**DATA AND RESULTS**

**Part 1**

**Table 7-1. Test Data for Measuring Alpha**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **STEP** | **IE,mA** | **IC,mA** | | **Effects in IC of increasing IE** |
| 2 | Minimum | 0.000002132 | | As The Ie increases so does |
| 2 | Maximum | 1.191 | | The Ic |
| **Step** | **IE,mA** | **IB,µA** | **IC,mA** | **Collector Voltage** |
| 4 | 2 | 415.793 | 1.652 | 4 |
| 4 | 2.4 | 497.568 | 1.977 | 4 |
| 4 | α= IC/IE=3.97 | | | |

**Table 7-2. Test Data for Measuring Beta**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **IB,µA** | **IC,mA** | **Effects in IC of increasing IB** |
| 8 | 10 | 2.41 | Decreases |
| 9 | Maximum | 6.762 | Increases |
| **Step** | **IB,µA** | **IC,ma** | **Collector Voltage** |
| 10 | 25 | 5.113 | 4 |
| 11 | 30 | 5.884 | 4 |
| 12 | β= IC/IB=204 | | |

**Part 2**

**Table 7-3. Input characteristics of the common emitter configuration**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **VCE= 3 V** | | | **VCE= 5 V** | | |
| **VBE** | **VRB (mV)** | **IB=VRB/RB(µA)** | **VBE** | **VRB (mV)** | **IB=VRB/RB(µA)** |
| 0.63 V |  |  | 0.63 V |  |  |
| 0.64 V |  |  | 0.64 V |  |  |
| 0.65 V |  |  | 0.65 V |  |  |
| 0.66 V |  |  | 0.66 V |  |  |

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**Table 7-4.Output Characteristics of the Common Emitter**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VCE** | **IB = 10µA** | | **IB = 20µA** | | **IB = 30µA** | | **IB = 40µA** | | **IB = 50µA** | |
| **VRC**  **(mV)** | **IC=VRC**  **(mA)RC** | **VRC**  **(mV)** | **IC=VRC**  **(mA)RC** | **VRC**  **(mV)** | **IC=VRC**  **(mA)RC** | **VRC**  **(mV)** | **IC=VRC**  **(mA)RC** | **VRC**  **(mV)** | **IC=VRC**  **(mA)RC** |
| **0.2V** |  |  |  |  |  |  |  |  |  |  |
| **0.4V** |  |  |  |  |  |  |  |  |  |  |
| **0.8V** |  |  |  |  |  |  |  |  |  |  |
| **1.0V** |  |  |  |  |  |  |  |  |  |  |
| **3.0V** |  |  |  |  |  |  |  |  |  |  |
| **5.0V** |  |  |  |  |  |  |  |  |  |  |

**Table 7-5.Input Characteristics of Common Collector**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VCE= 3 V** | | | **VCE= 5 V** | | | **VCE= 7 V** | | |
| **VCB** | **VRB (mV)** | **IB = VRB/RB**  **(µA)** | **VCB** | **VRB**  **(mV)** | **IB = VRB/RB**  **(µA)** | **VCB** | **VRB**  **(mV)** | **IB = VRB/RB**  **(µA)** |
| **2.4V** |  |  | **4.4V** |  |  | **6.4V** |  |  |
| **2.38V** |  |  | **4.38V** |  |  | **6.39V** |  |  |
| **2.36V** |  |  | **4.36V** |  |  | **6.38V** |  |  |
| **2.34V** |  |  | **4.34V** |  |  | **6.36V** |  |  |

**STEP8**

**Figure 7-5. Input Characteristic of the Common Emitter Bias Circuit**

**BASIC ELECTRONICS**

**STEP 9**

**Figure 7-6. Output Characteristic of the Common Emitter Bias Circuit**

**STEP 10**

**Figure 7-7.Input Characteristic of the Common Collector Bias Circuit**

**BASIC ELECTRONICS**

**REVIEW QUESTIONS**

1. Define Beta

2. Describe in detail a procedure for getting beta.

3. What is the significance of getting beta?

**Answers to Review Questions**

1.

2.

3.

**DISCUSSION OF FINDINGS:**