電子電路實驗 6: Linear DC Regulator

實驗預報

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1 Objectives

1. To familiarize with the construction and characteristics of Linear Regulator.
2. To visualize how Zener diode operate and its I–V characteristics

2 Procedures

2.1 Differential Mode Small Signal Analysis

1. Use 1 kΩ resistance for R_2 , 100 kΩ variable resistance for R_L, 10 kΩ variable resistor for R , R_1 in Fig. 2.
2. In order to measure the breakdown voltage of the Zener diode, slowly increase V_{DC} until the C.C. signal alerts in the power supply.
3. Record the V_{DC} value as breakdown voltage V_r when the C.C. signal alerts.
4. Record the breakdown voltage V_r.
5. Provide voltage source +15 V, −15 V, and $V_{DC} = 10$ V to the circuit.
6. No need to use the Oscilloscope and function generator in the experiment
7. Adjust the variable resistor R_and observe how the output voltage will change.
8. Adjust the variable resistor R_1 and R until the output voltage $V_o = 5$ V.
9. Record the value of R_1, R. (Usually, $R \leq 500\,\Omega$)
10. Adjust the variable resistor R_L and observe how the output voltage will change.
11. Record the output voltage V_o and R_L.
12. Keep the previous adjustment of R , R_1 constantly and adjust $R_L = 50$–100kΩ .
13. Adjust the input voltage V_{DC} and observe how the output voltage will change.
14. Record the output voltage V_o and V_{DC}.