Homework for Chapter 9

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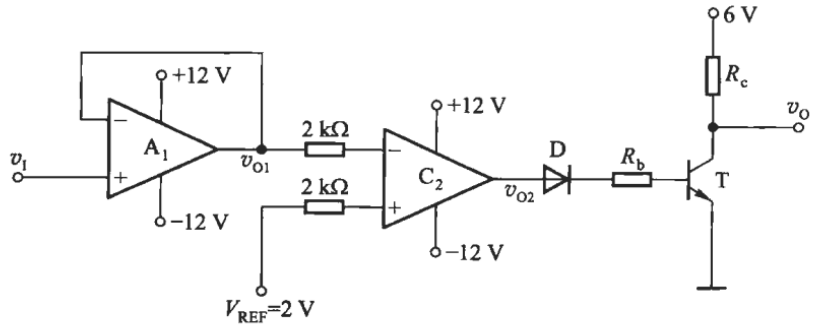
10.8.1　电路如图题 10.8.1 所示，A_1 为理想运放，C_2 为比较器，二极管 D 也是理想器件，$R_b = 51\ \text{k}\Omega$，$R_c = 5.1\ \text{k}\Omega$，BJT 的 $\beta = 50$，$V_{CES} \approx 0$，$I_{CEO} \approx 0$，试求：(1) 当 $v_I = 1$ V 时，v_O =？(2) 当 $v_I = 3$ V 时，v_O =？(3) 当 $v_I = 5 \sin \omega t$ V时，试画出 v_I、v_{O2}和 v_O的波形。



图题 10.8.1

1 Problem 1

Adjust the value of R_1 and R_3 until:

$$V_{C2} = \frac{V_{CC}}{2} = 6\ \text{V}$$

2 Problem 2

Adjust the value of R_2 should solve the Crossover Distortion issue.

3 Problem 3

When D_1, D_2 or R_2 is open-circuited

$$P_{T1} = P_{T2} = \beta I_B V_{CE} = \beta \cdot \frac{V_{CC} - 2|V_{BE}|}{R_1 + R_3} \cdot \frac{V_{CC}}{2} = 1156\ \text{mW} > P_{CM}$$

Either T_1 or T_2 will be damaged.