



$$C_1 > \frac{1}{1000 \pi f_{\text{least}}} > 16 \mu F$$

$$20 \text{ Hz} - 20 \text{ kHz}$$

عدم تأثیر ال DC / AC
کلی ال AC

$$C_2 > \frac{10}{2 \pi f_{\text{least}} R_E}$$

و حماية V_{Bias}

لتجنب ابطا ال
التي سببتها R_E

$$C_3 < \frac{1}{2 \pi f_{\text{Highest}} R_L}$$

لازاله الغطاء C_3

$$C_4 > \frac{1}{2000 \pi f_{\text{least}}}$$

C_4 : للتحايط من V_{DC}
لا تأثیر ال DC ال AC

① حدد I_C و V_{RE} و R_E

② I_B و R_1 و R_2

③ $I_C = 10 I_B$ KVL ال R_2

④ R_1

$$I_{R_2} = 10 I_B$$

منه يمكن استخدام V_{in}
 $I_{R_1} = 11 I_B$

R_E : $V_{\text{RE}} = 0.1 V_{\text{CC}}$
Reverse / negative
feedback

R_L : $I_C = 20\% I_{C_{\text{max}}}$

$$V_{\text{CE}} = \frac{V_{\text{CC}}}{2}$$

$$BC107, I_{cmax} = 100mA, \beta = 110$$

$$I \text{ will take } I_c = 20\% \text{ } 100mA$$

$$\otimes I_c = 20mA$$

$$\otimes V_{cc} = 12V, V_{RE} = 10\% \times 12 = 1.2V$$

$$\otimes \otimes R_E = \frac{1.2}{20mA} = 60\Omega$$

$$\text{Assume } R_L = \frac{12 - 6 - 1.2}{20mA} = \frac{V_{cc} - \frac{V_{CE}}{2} - V_{RE}}{20mA \text{ } I_c}$$

$$\otimes \otimes R_L = 240\Omega$$

$$\otimes I_B = \frac{I_c}{\beta} = \frac{20mA}{110} = 0.182mA$$

$$\otimes V_{R_2} = 0.7 + 1.2 = 1.9$$

$$\otimes I_{R_2} = 10 \times \frac{0.182mA}{I_B} = 1.82mA$$

$$\otimes \otimes R_2 = \frac{V_{R_2}}{I_{R_2}} = \frac{1.9}{1.82mA} = 1044\Omega \approx 1K$$

$$V_B = V_{cc} \frac{R_2}{R_1 + R_2} \Rightarrow R_1 = \frac{V_{cc} R_2}{V_B} - R_2$$

$$\otimes \otimes R_1 = \frac{12 \times 1K}{1.9} - 1K = 5316\Omega \approx 5.3K$$

$$C_1 > 16\mu F \approx 20\mu F$$

$$C_2 > 1.3mF \approx 1.5mF$$

$$C_3 < 0.33nF \approx 1pF$$

$$C_4 > 8\mu F \approx 10\mu F$$

