Literature:

Feedback: P 755-836

Assignments:

10.1:

A CE stage circuit without (by setting $R_f = 0$) or with feedback (by setting $R_f = 20\ \Omega$) is shown in Fig. 1.

(1) Set $R_f = 0$, i.e., without negative feedback, run the simulation and find out $A_v = ?$ $f_L = ?$ $f_H = ?$ THD = ? @ 20KHz.

(2) Set $R_f = 20$, i.e., with negative feedback, run the simulation and find out $A_v = ?$ $f_L = ?$ $f_H = ?$ THD = ? @ 20KHz.

(3) Comparing the results obtained in (1) and (2), discuss what is the advantages and disadvantages by introducing negative feedback into the circuit.

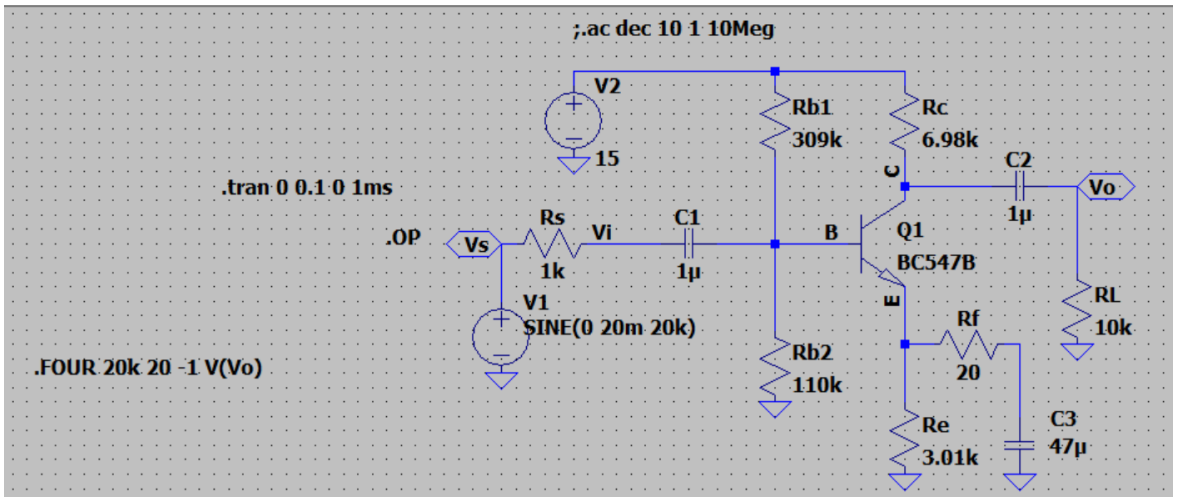


Fig. 1 A CE stage

Solution:

(1) For $R_f = 0\ \Omega$, A_V_simulated = 127.6 --(42 dB); f_L = 127 Hz; f_H = 543 KHz; THD = 10.6%

(2) For $R_f = 20\ \Omega$, A_V_simulated = 78.5 --(37.9 dB); f_L = 78.1 Hz; f_H = 865 KHz; THD = 4.45%

(3) Disadvantage: gain $A_v$ is dropped. Advantages: frequency bandwidth becomes wider; harmonic distortion becomes smaller.