

ECE 302 - Homework Set #11 - 30 points

1) Common-Base Design

A) USE THE MID-BAND DESIGN OF THE HW#9 SOLUTION AND LET $C_1 = C_2 = C_3 = 47\mu F$. SIMULATE THIS CIRCUIT USING THE FULL 2N3904 MODEL IN OUR NOTES (YOU CAN FIND THIS IN THE FILE "LIBRARY" FILE USED IN CLASS NOTES ON THE ECE 402 HOME PAGE), AND OBTAIN THE OPERATING POINT DATA.

B) USING THE DATA OF A) AND PICK THE VALUES OF C_1 , C_2 AND C_3 SUCH THAT $f_L \approx 20\text{Hz}$ USING THE SHORT-CIRCUIT TIME CONSTANT METHOD.

C) USING THE DATA OF A) AND THE OPEN-CIRCUIT TIME CONSTANT METHOD, CALCULATE THE APPROXIMATE VALUE OF f_H .

D) RE-RUN YOUR SIMULATION OF A) USING YOUR VALUES OF C_1 , C_2 AND C_3 FOUND IN B). MEASURE f_H , f_L AND A_v . USING THE DATA OF A) CALCULATE A_v . COMPARE THE MEASURED VALUES OF f_H , f_L AND A_v WITH YOUR CALCULATED VALUES.