Analog Electronics

Experiment 4: Differential Amplifier

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Slot: L33+L34

Aim:

To design the differential amplifier for given specifications and calculating the common mode rejection ratio.

Design:

On simulating we could find the output voltage (i.e., by connecting oscilloscope with it's positive terminal to the Vc of the Q_2)

Npn-transistor-(2N2222A)

$V_{in(p-p)}$ =100mV;

Frequency = 1kHz;

$V_{cc} = V_{EE}$ = 12V;

$R_1 = R_2 = R_3$ =1kΩ;

For common mode,

$A_{CM} = V_o / V_{in}$;

= (49.279)/(99.354)

= 0.495

For differential mode,

$A_d = V_0 / V_{in}$;

= (7.906/98.652)x10 -3

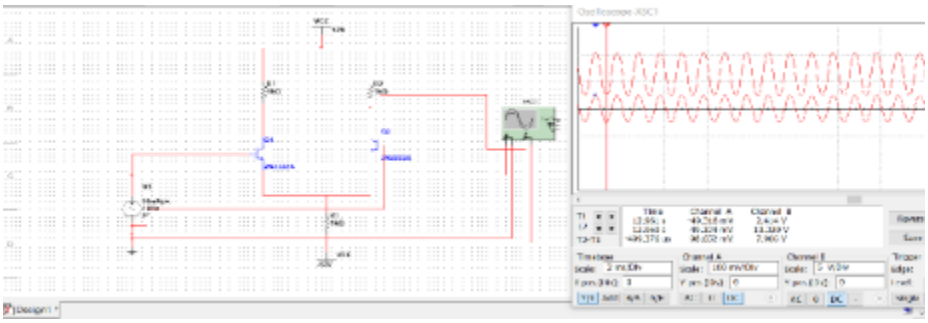
= 79.85

CMRR=A_d / A_{cm}

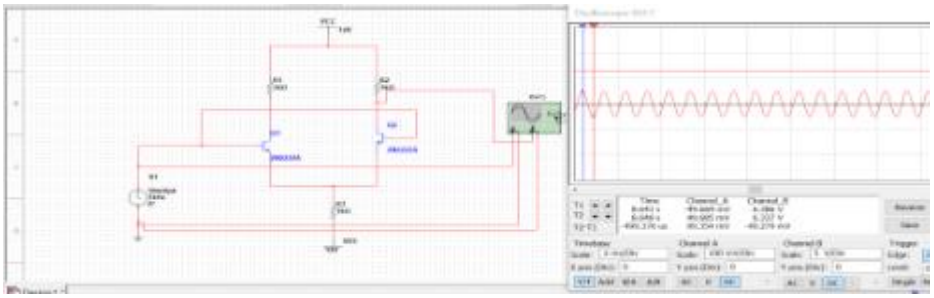
= 20log(161.33)

= 44.153dB

Simulation for differential mode:



Simulation for common mode:



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