Analog Electronics

Experiment 2: Common source amplifier

By: Sparsh Arya

Registration number: 17BEC0656

Slot: L33+L34

Aim:

To design a common source amplifier for given specification and plot it's frequency response.

Design:

V_{cc} =12V

V_{DS} =40% of V DD

V_{DD} = 10V

V_{DS} =4V

R_g (R_1)=1MΩ

R_s =2kΩ

A_v =0.9

V_{in} =100mV

V_{gs} =2.6V

$C_s = 1/(2*\pi*(1/g_m \| R_s)*f)$

=200uF

$R_d = (V_{DD} - V_D)/I_D$

=10kΩ

$I_{DS} = (1/2)*k_n*(W/L)*(V_{gs} - V_t)^2$

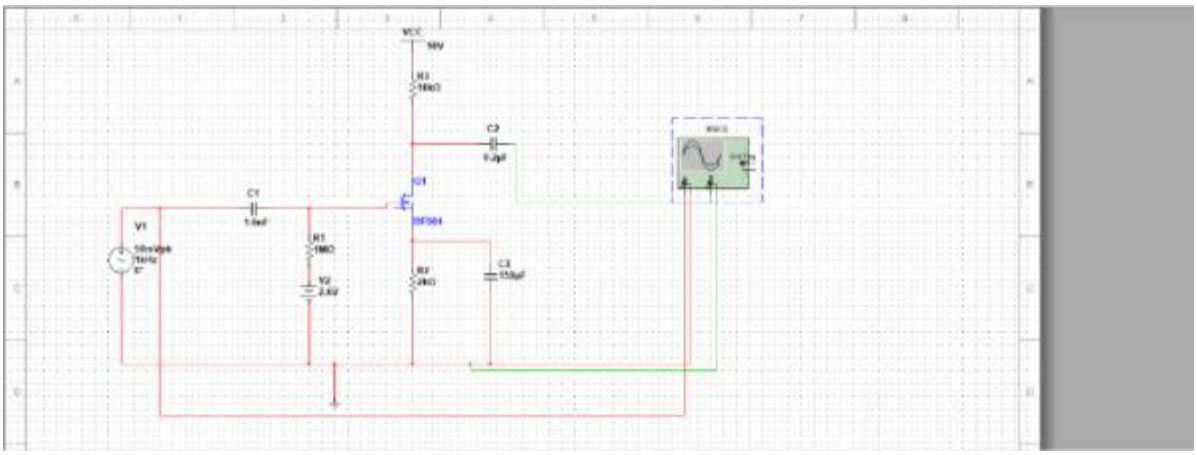
=0.5mA

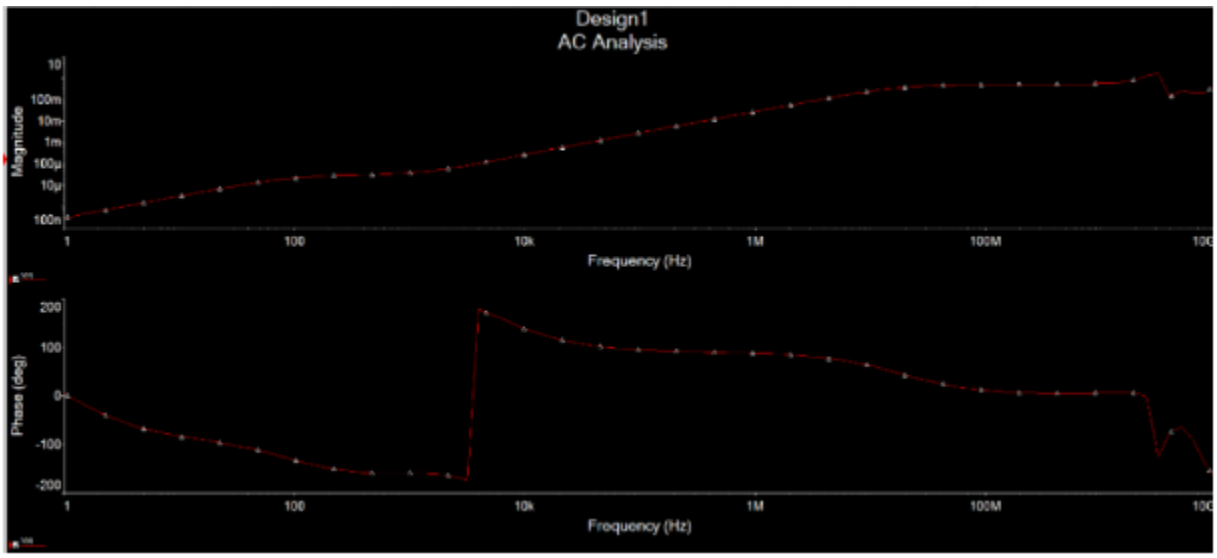
$g_m = 2I_d / V_{ov}$

=100mV/A

C_1 =1.6nF

C_2 =0.22uF


VCC
50V
C2
C1
V1
R1
C3


Design1
AC Analysis
Magnitude
10
100m
10m
1m
100µ
10µ
100n
1
100
10k
1M
100M
Frequency (Hz)
Phase (deg)
200
100
0
-100
-200
1
100
10k
1M
100M
Frequency (Hz)

The end