MOSFET Amplifier Characteristics

AIM:

To verify the frequency response analysis of single stage MOSFET using LTspice software

APPARATUS REQUIRED:

LTspice software

PROCEDURE:

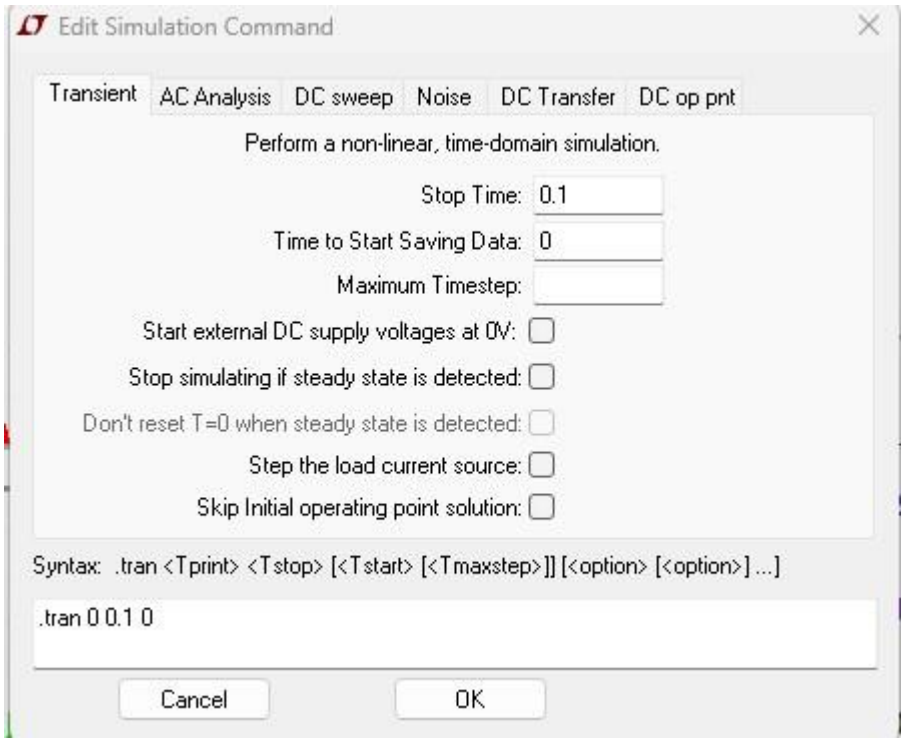
Using the components available in LTspice a circuit is build that is used to verify three types of frequency response analysis:

i) AC analysis
ii) Transient analysis

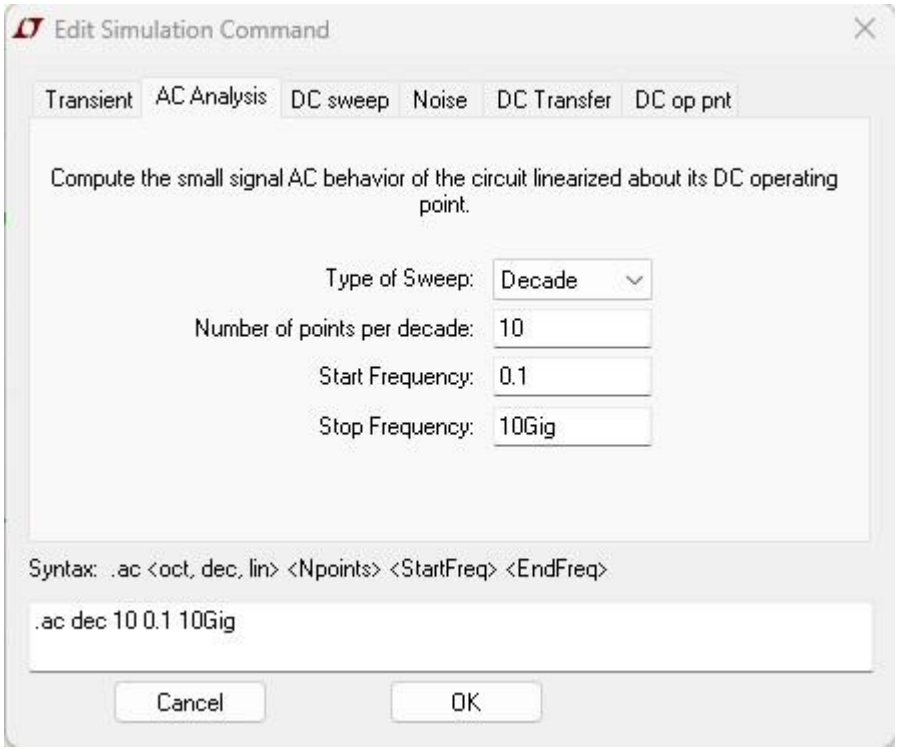
Procedure:

- **Design the circuit with necessary components as per the circuit diagram.**
- **Assign the NMOS transistor Q1 as Si7336ADP.**
- **Assign the values to the capacitors as C1 and C2 as 0.12u.**
- **Assign the values to the resistors as R1 = 470, R2 = 150, R3 = 200k and R4 = 100k.**
- **Assign the V1 Voltage values in SINE function as DC Offset [V] = 0 Amplitude [V] = 0.05m Frequency [Hz] = 100.**
- **Assign the V2 voltage as 15.**
- **Select DC op point and run the file.**
- **Then, in AC Analysis give, Type of Sweep as Decade No. of Points as 10 Start Frequency as 10m Stop Frequency as 1Meg.**
- **Then, in Transient Analysis give stop Θme as 10m, Time to start saving data as 0.Save the waveforms of the given circuit in all the analysis given above and calculate the bandwidth of the amplifier.**

Command for Transient operating point:

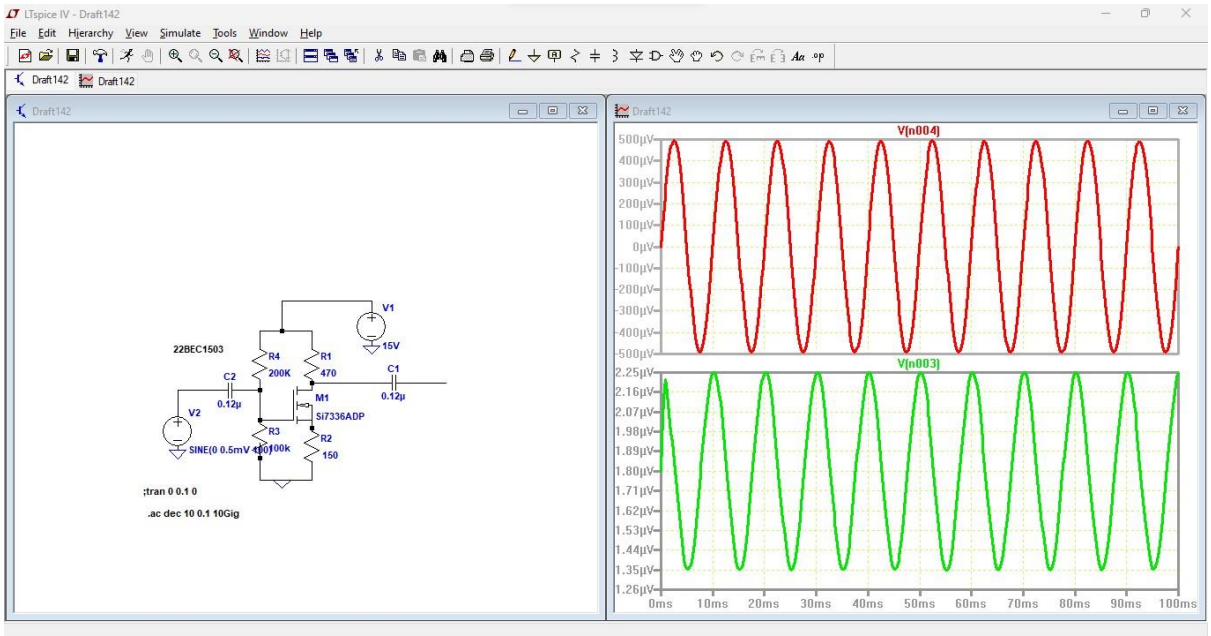


Command for AC analysis:



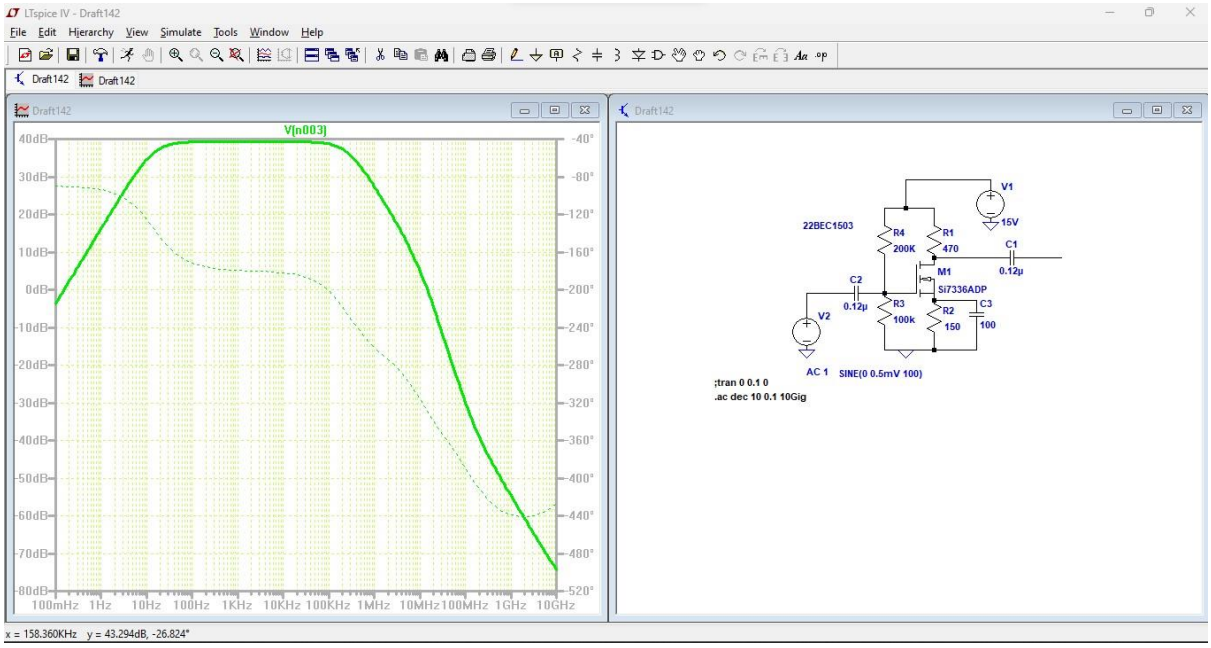
Circuit and output:

Transient response:

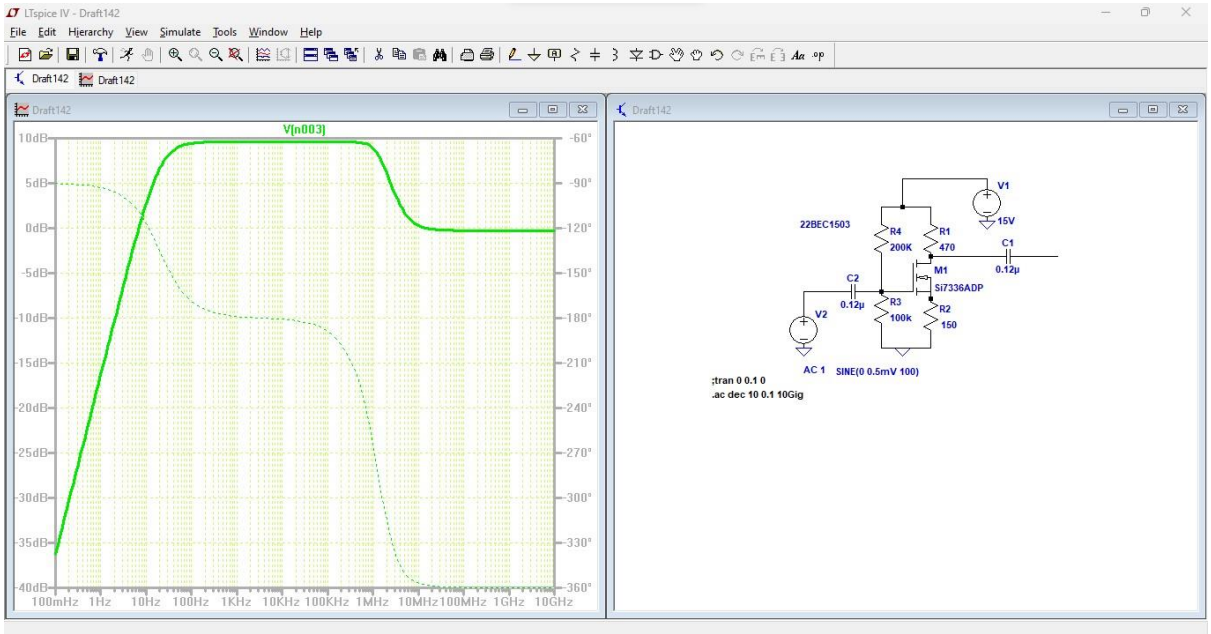


AC response:

i) With capacitor:



ii) Without capacitor:



Result:

The frequency response of single stage MOSFET has been verified using LTSPICE software. The phase shift in transient analysis is 180 . The bandwidth of the amplifier circuit in ac analysis is 1.82 MHz.