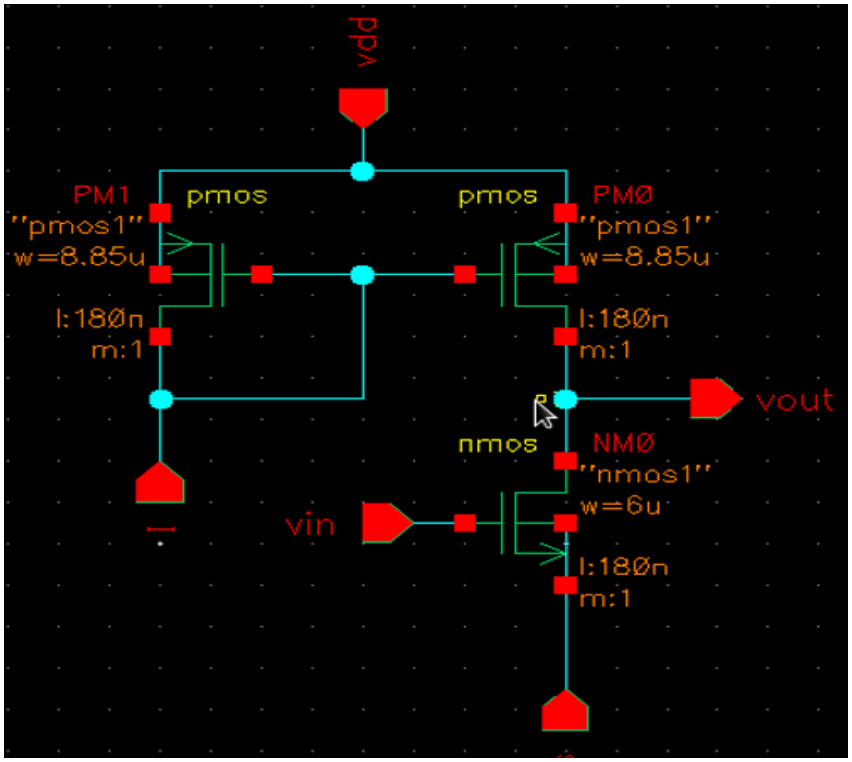
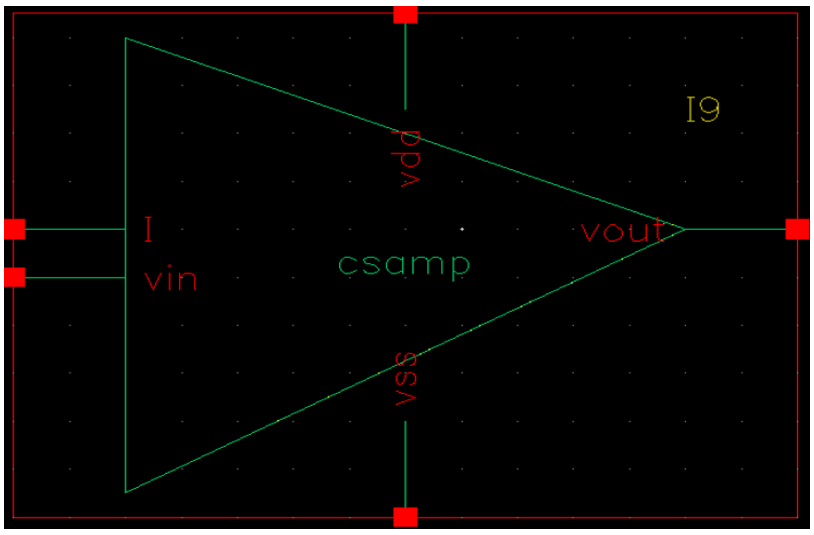
Common Source Amplifier – Schematic Design



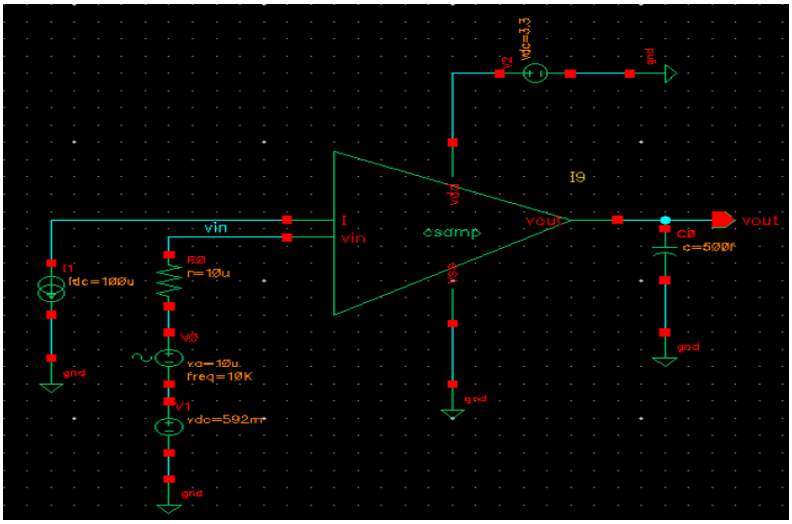
Common Source Amplifier schematic

Table of components for building the schematic:

Library Name	Cell Name	Properties
gpdk180	pmos	W = 8.85u, L = 180n
gpdk180	nmos	W = 6u, L = 180n



Common Source Amplifier symbol

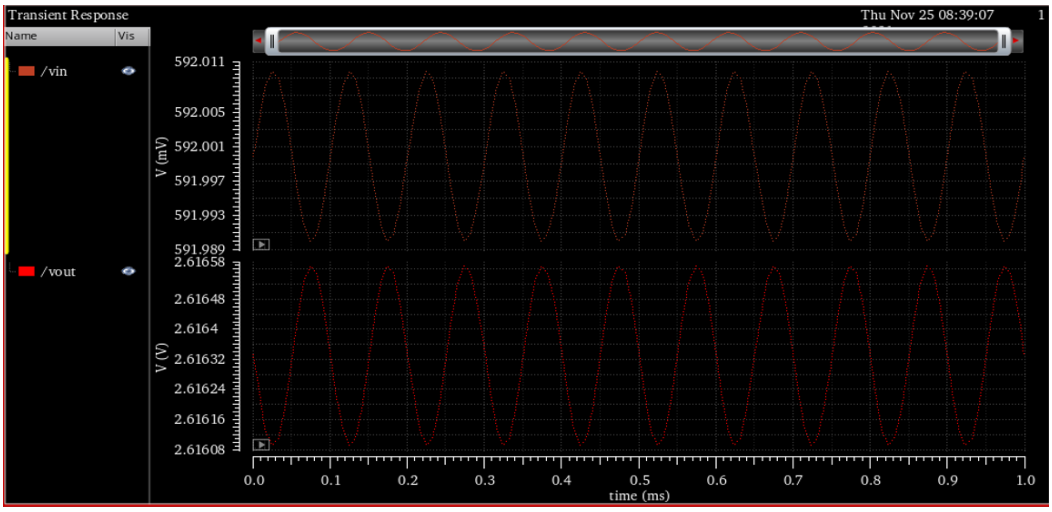


Common Source Amplifier test schematic

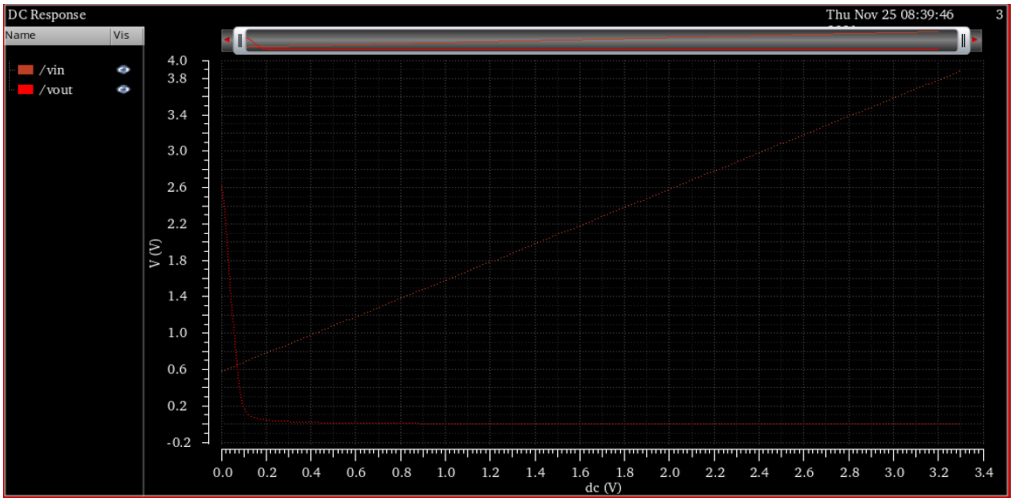
Table of components for building the test schematic:

Library Name	Cell Name	Properties
analogLib	Vdc	DC Voltage = 3.3 V (V_{dd})
analogLib	Vsin	AC Magnitude = 1 V, Amplitude = 10u V, Frequency = 1K Hz
analogLib	Vdc	DC Voltage = 592m V
analogLib	res	Resistance = 10u Ohms
analogLib	idc	DC Current = 100u A
analogLib	cap	500f F

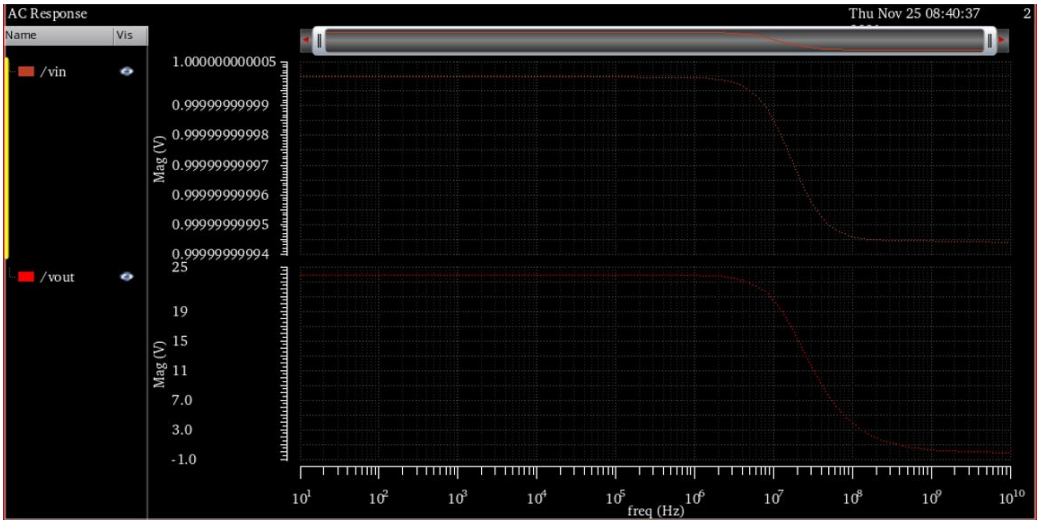
Analog Simulation with spectre for Common Source Amplifier:



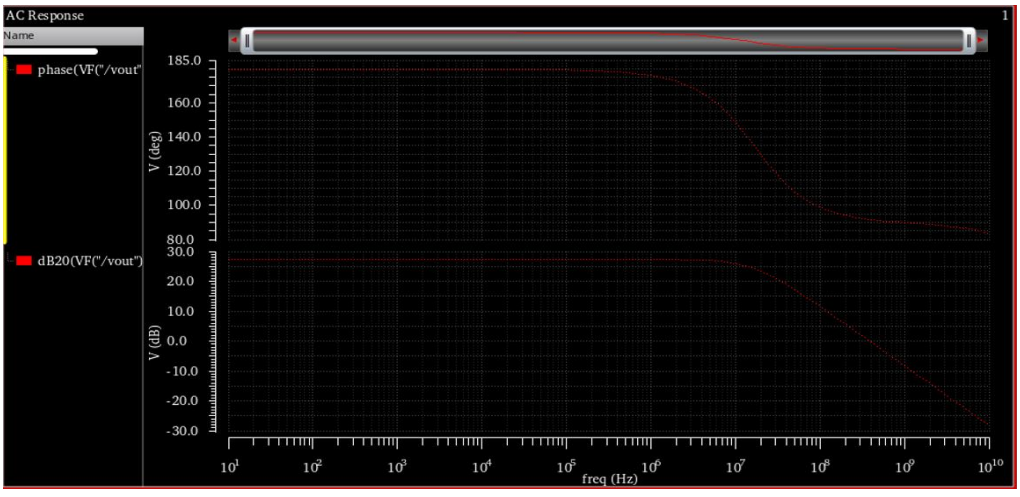
Transient Response



DC Response



AC Response

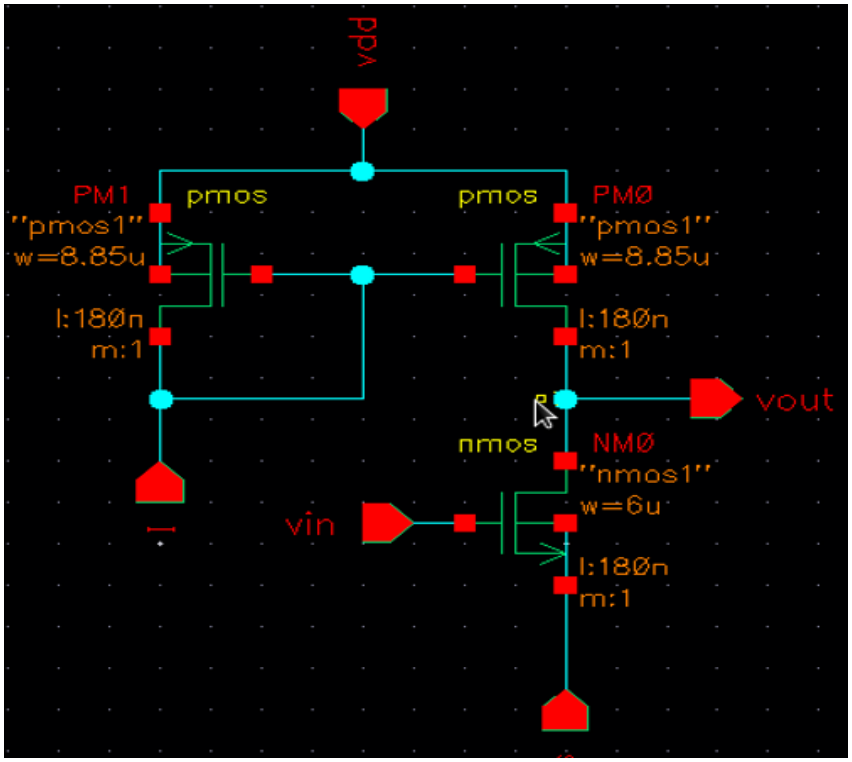


AC Magnitude and Phase Response

Table of values to setup for different analysis:

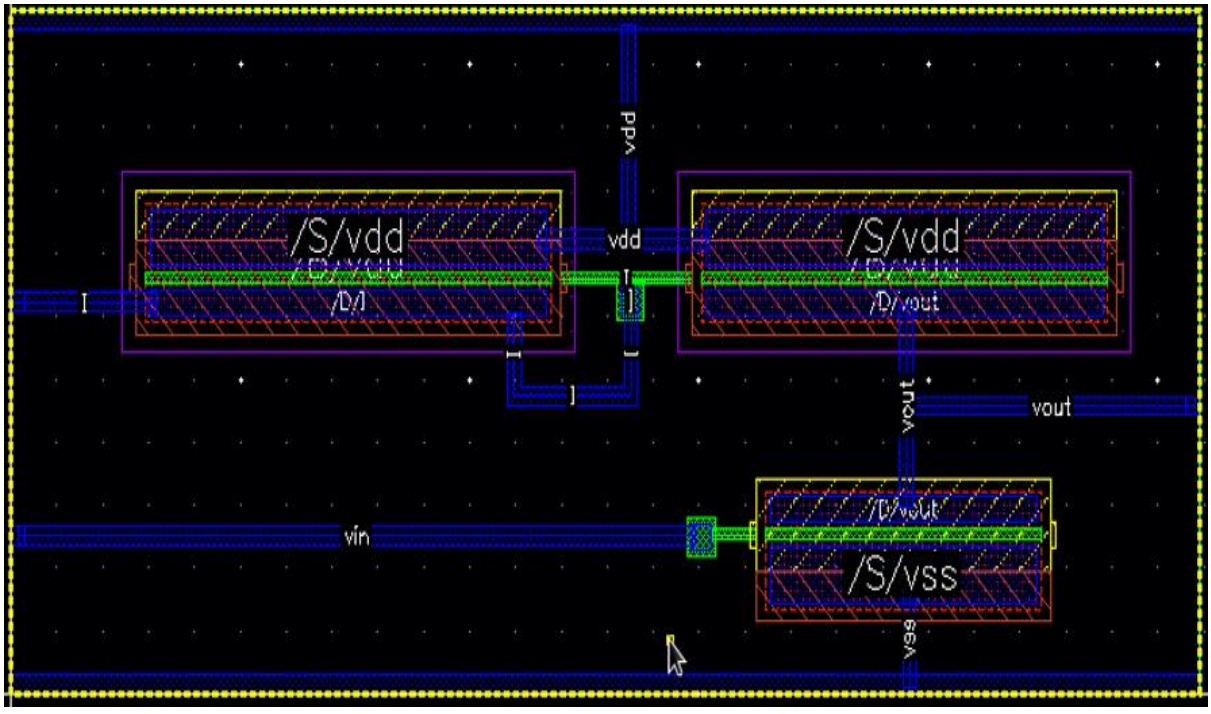
Analysis Name	Settings	Properties
Transient	trans	Stop time = 5m, moderate
DC	DC Analysis	Save DC Operating point
	Sweep Variable Component Parameter	Component Name = Select input signal component (Vpulse) Parameter Name = dc
	Sweep Range Start – Stop	Sweep Type = Linear Start = -5, Stop = 5, Step size = 10m V
AC	Sweep Range Start – Stop	Sweep Type = Logarithm, Start = 10, Stop = 10G, Points Per Decade = 10

Common Source Amplifier Layout Design



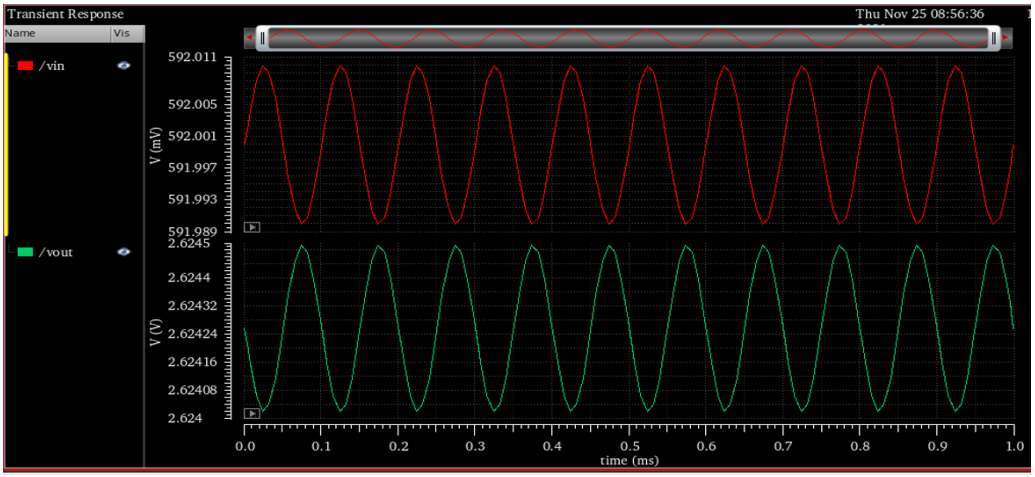
Common Source Amplifier schematic

Common Source Amplifier Layout:

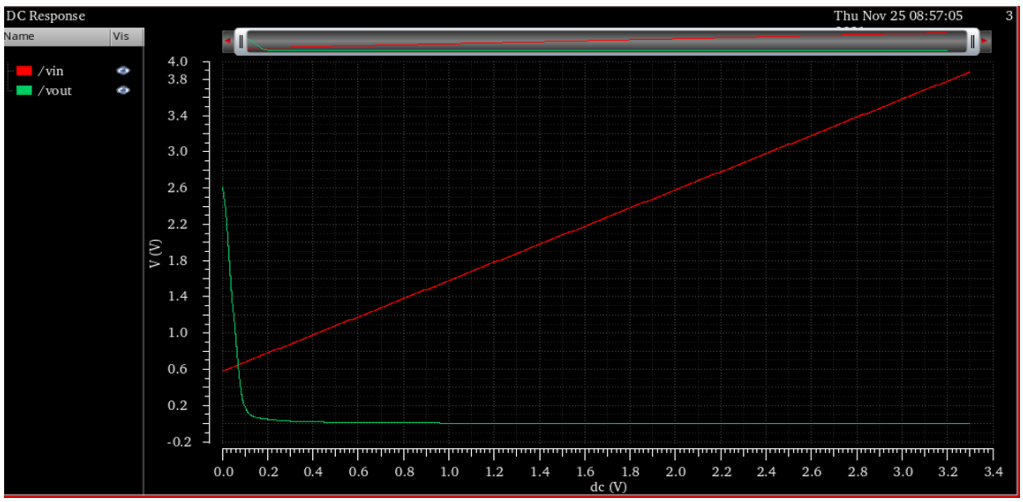


Common Source Amplifier Layout

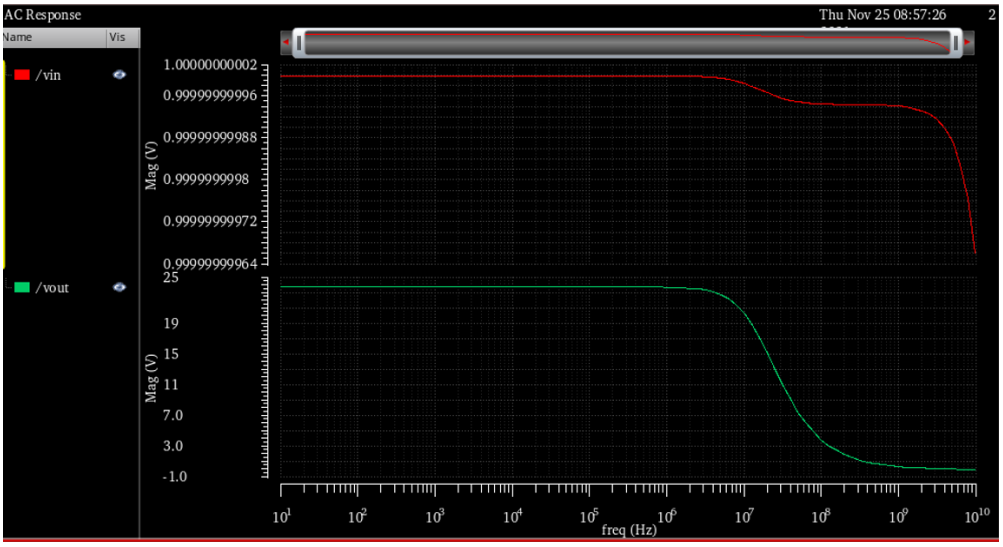
Analog Simulation with spectre for Common Source Amplifier:



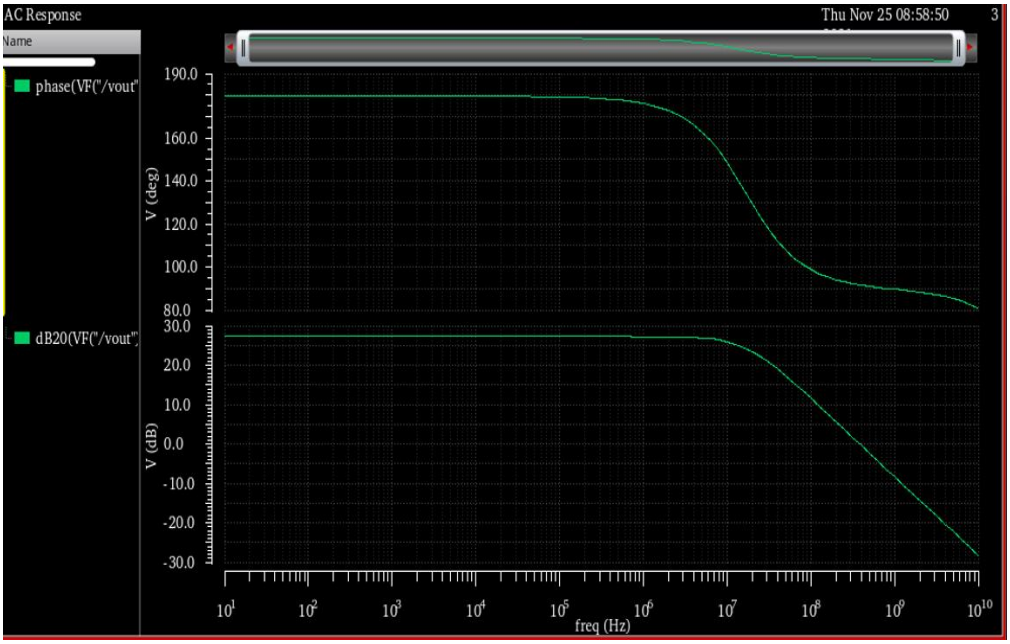
Transient Response



DC Response

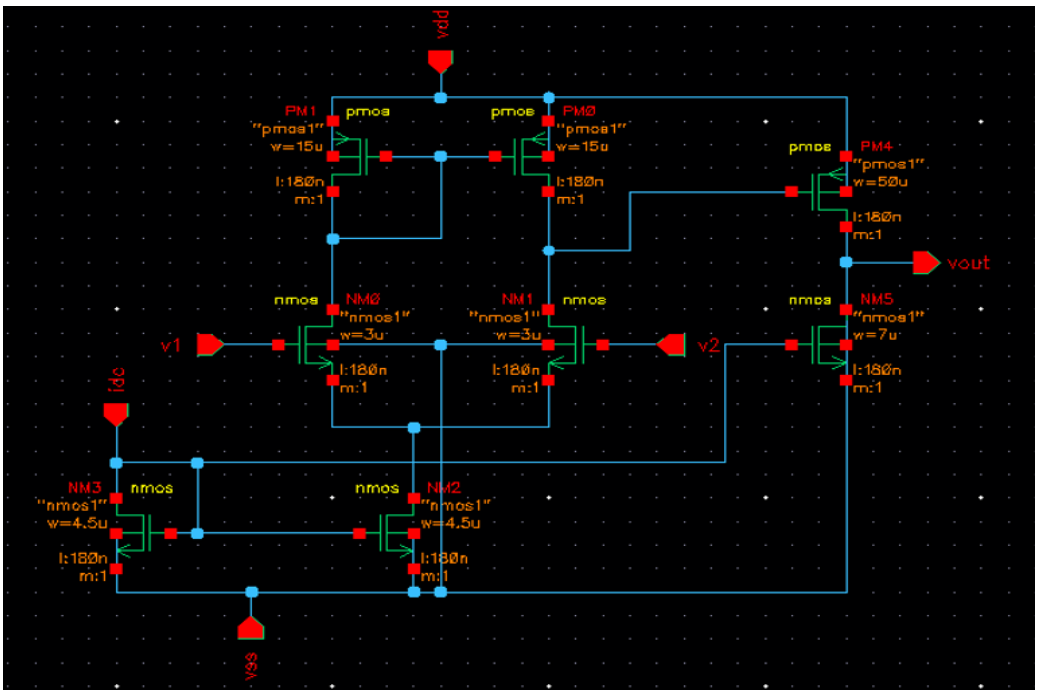


AC Response



AC Magnitude and Phase Response

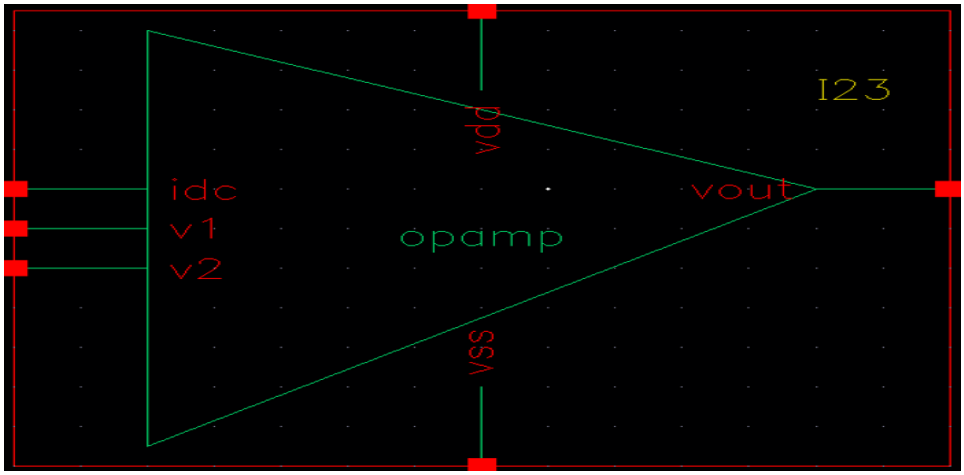
Operational Amplifier – Schematic Design



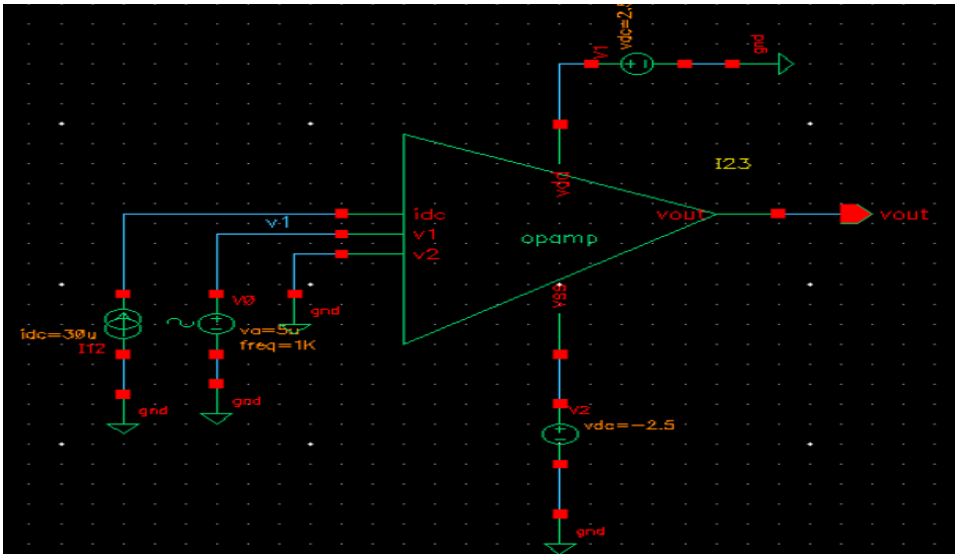
Operational Amplifier schematic

Table of components for building the schematic:

Library Name	Cell Name	Properties
gpdk180	pmos	W = 15u, L = 180n W = 50u, L = 180n
gpdk180	nmos	W = 3u, L = 180n W = 4.5u, L = 180n W = 7u, L = 180n



Operational Amplifier symbol

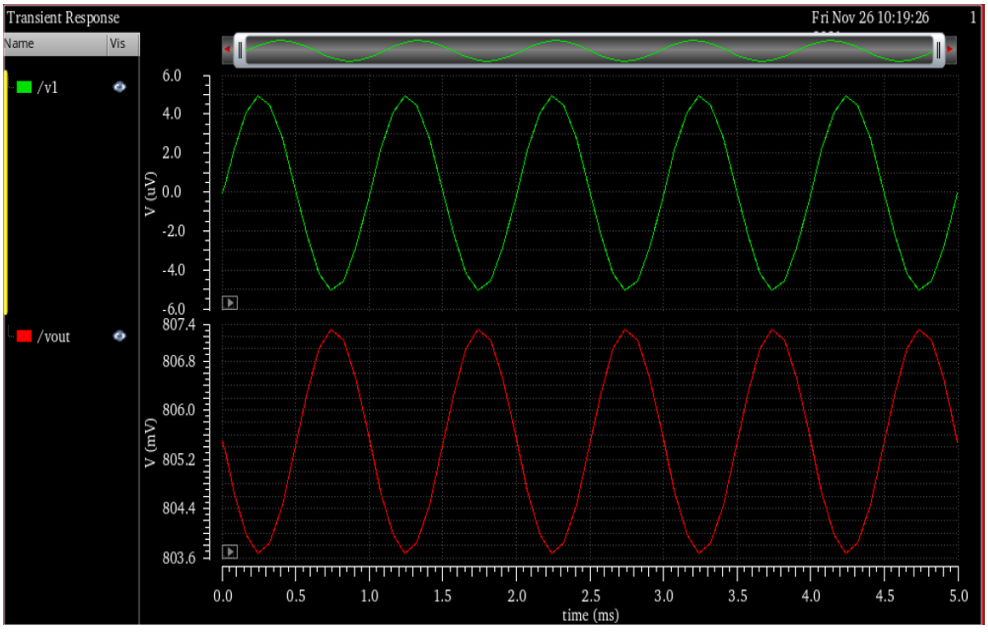


Operational Amplifier test schematic

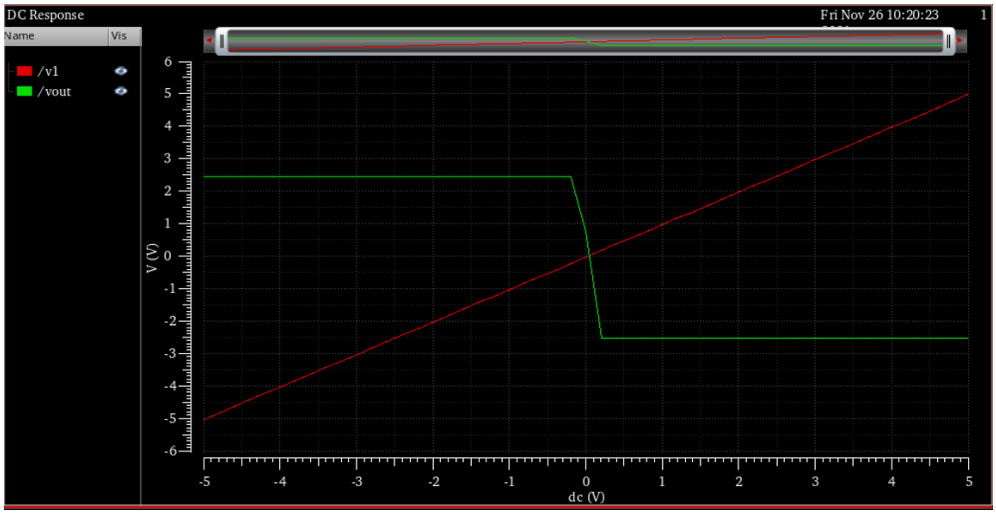
Table of components for building the test schematic:

Library Name	Cell Name	Properties
analogLib	Vdc	DC Voltage = 2.5 V (V_{dd}) DC Voltage = -2.5 V (V_{ss})
analogLib	Vsin	AC Magnitude = 1 V, DC Voltage = 0 V, Offset Voltage = 0 V Amplitude = 5u V, Frequency = 1K Hz
analogLib	idc	DC Current = 30u A

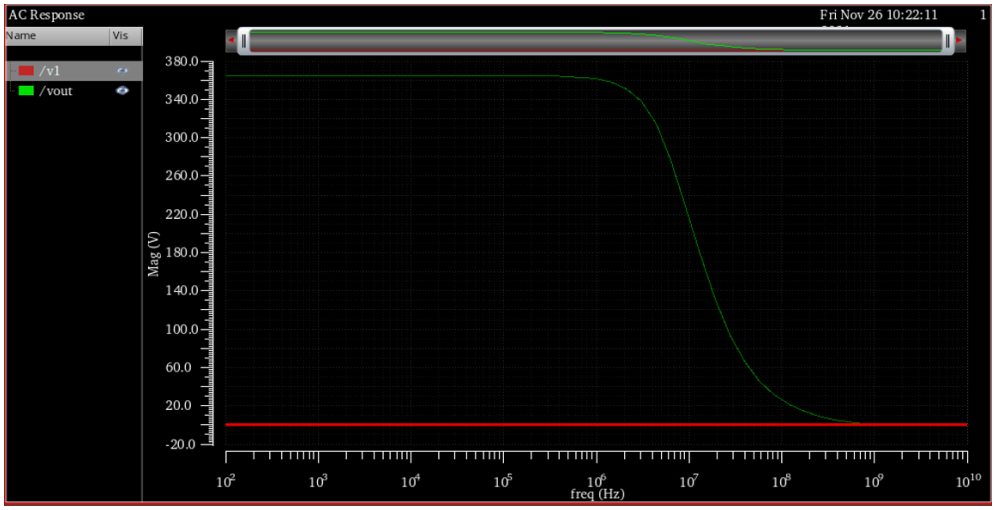
Analog Simulation with spectre for Operational Amplifier:



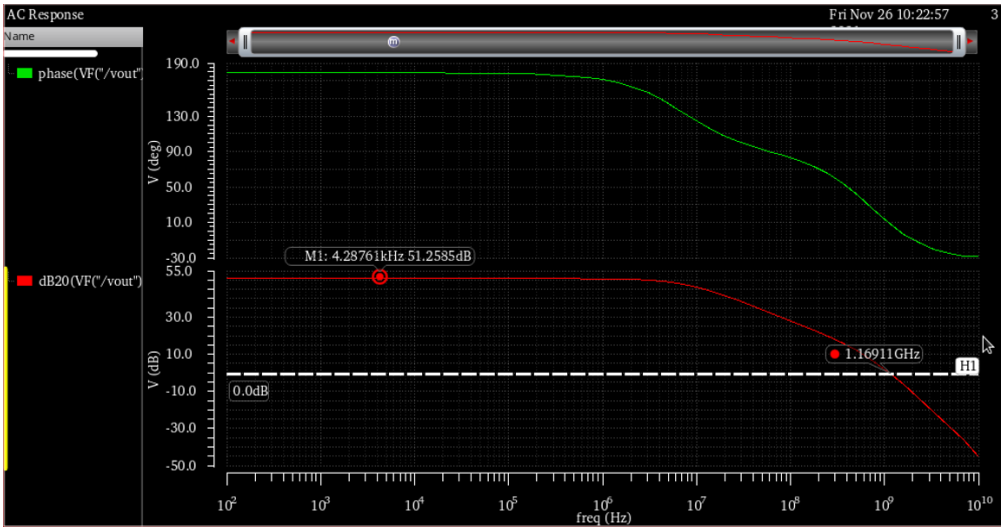
Transient Response



DC Response



AC Response

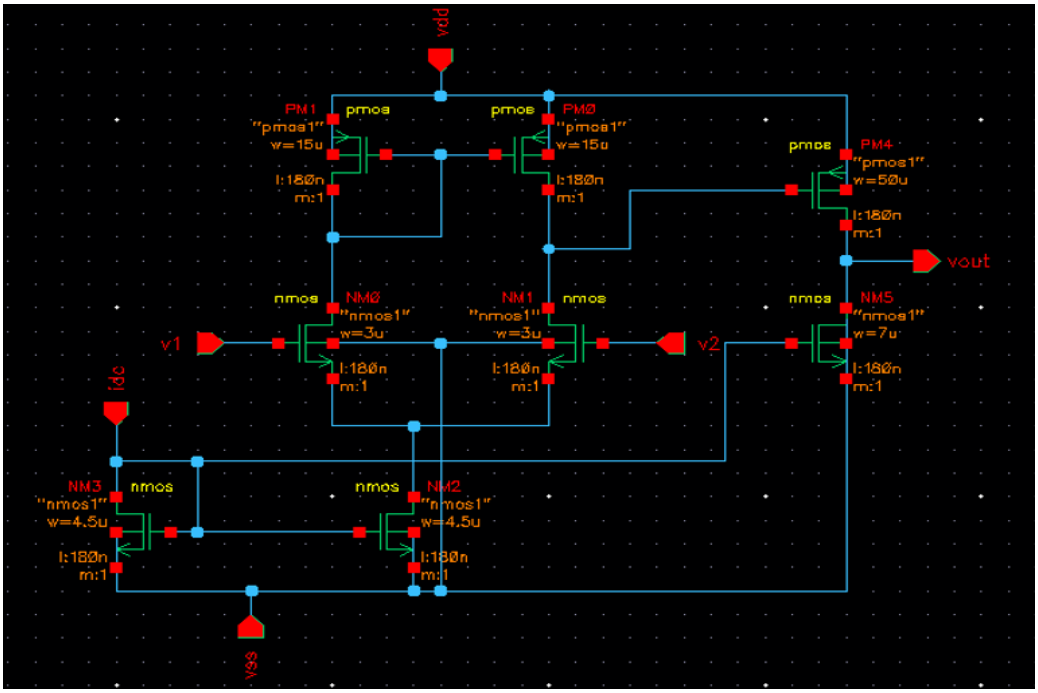


AC Magnitude and Phase Response

Table of values to setup for different analysis:

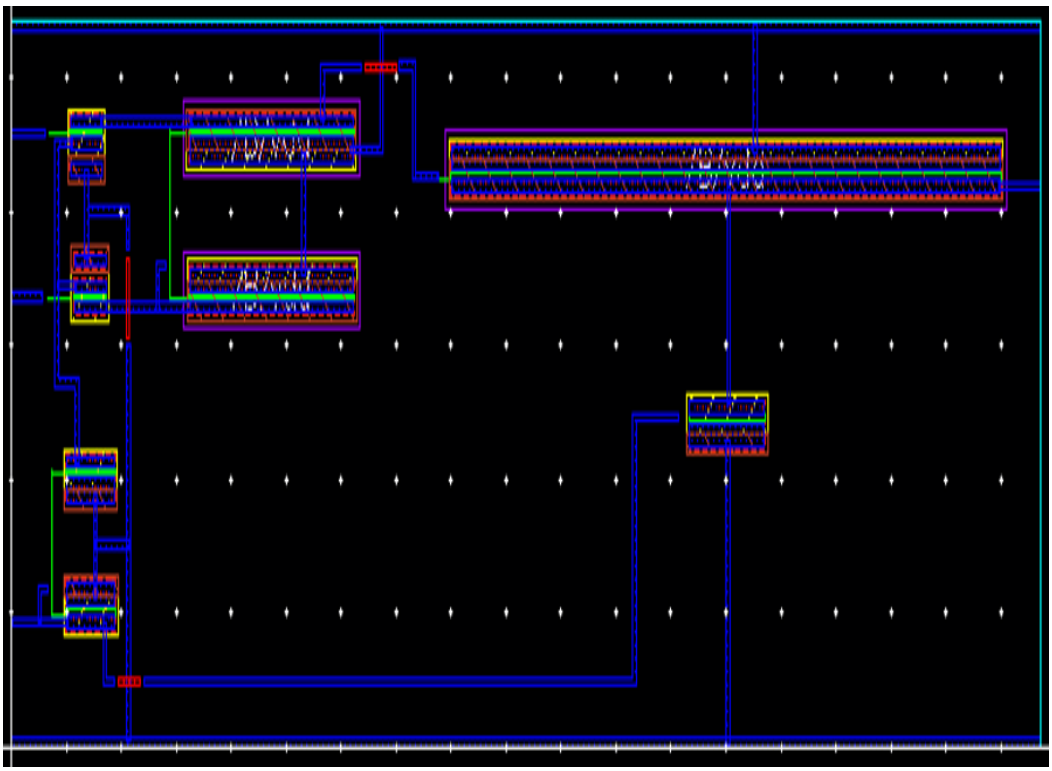
Analysis Name	Settings	Properties
Transient	trans	Stop time = 5m, moderate
DC	DC Analysis	Save DC Operating point
	Sweep Variable Component Parameter	Component Name = Select input signal component (Vpulse) Parameter Name = dc
	Sweep Range Start – Stop	Start = -5, Stop = 5
AC	Sweep Range Start – Stop	Sweep Type = Automatic, Start = 100, Stop = 10G,

Operational Amplifier Layout Design



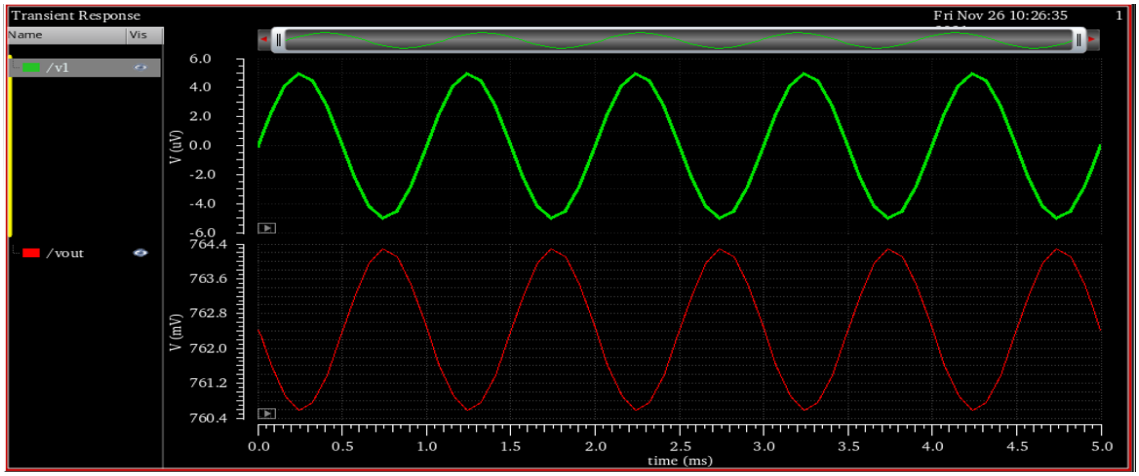
Operational Amplifier schematic

Operational Amplifier Layout:

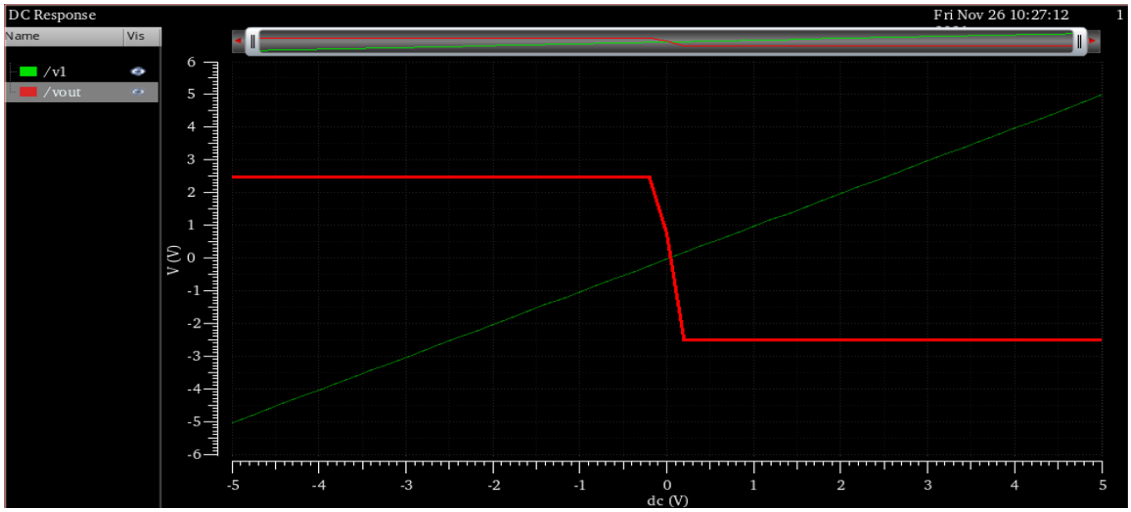


Operational Amplifier Layout

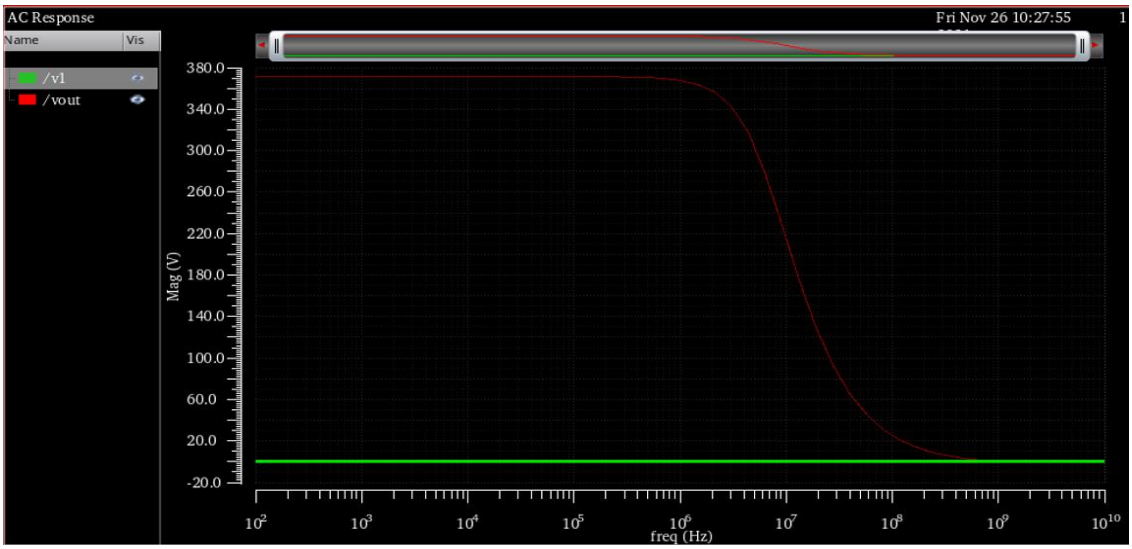
Analog Simulation with spectre for Operational Amplifier:



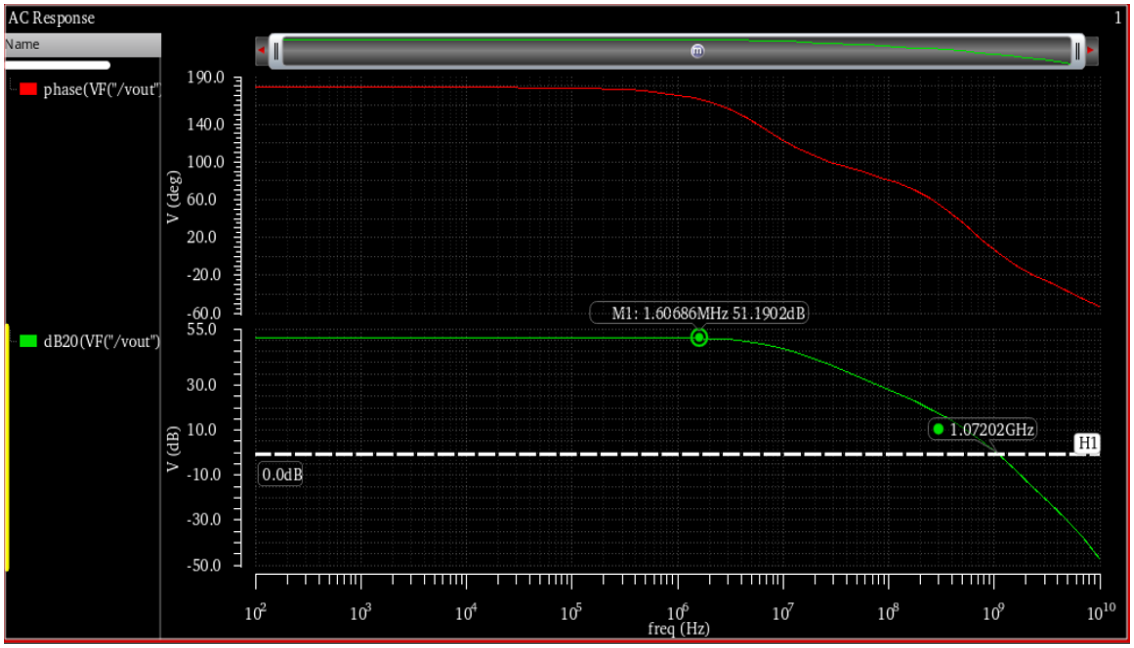
Transient Response



DC Response



AC Response



AC Magnitude and Phase Response