3.4 Common source amplifier with self-bias (Bypassed Rs)

Figure shows Common Source Amplifier With self-Bias. The coupling capacitor C1 and C2 which are used to isolate the d.c biasing from the applied ac signal act as short circuits for ac analysis. Bypass capacitor Cs also acts as a short circuits for low frequencyanalysis.
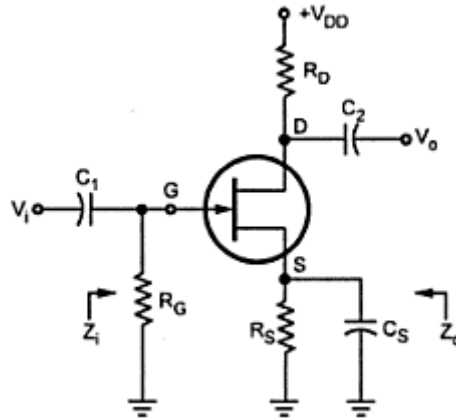

Fig 3.4.1 Common source amplifier model of MOSFET

[Source: "Electronic devices and circuits" by "Balbir Kumar, Shail.B.Jain, and Page: 136]

The following figure shows the low frequency equivalent model for Common Source Amplifier With self-Bias.
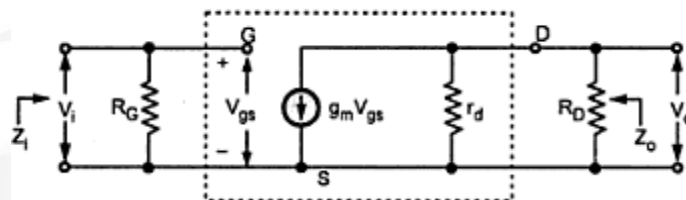

Fig 3.4.2 Small signal model for Common source amplifier model of MOSFET

[Source: "Electronic devices and circuits" by "Balbir Kumar, Shail.B.Jain, and Page: 136]

The negative sign in the voltage gain indicates there is a 180o phase shift between input and output voltages.
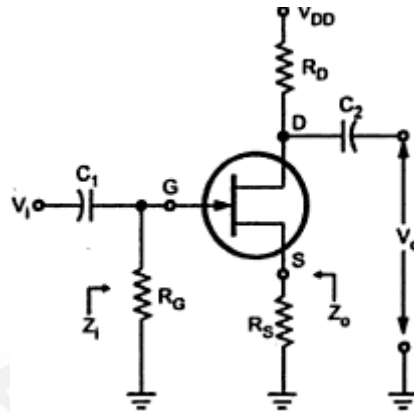
Common source amplifier with self-bias (UN bypassed Rs)

Fig 3.4.3 Common source amplifier model of MOSFET

[Source: "Electronic devices and circuits" by "Balbir Kumar, Shail.B.Jain, and Page: 136]

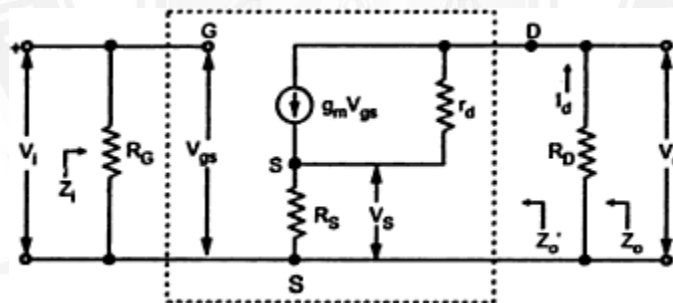Now Rs will be the part of low frequency equivalent model as shown in figure

Fig 3.4.4 Small signal model for Common source amplifier model of MOSFET

[Source: "Electronic devices and circuits" by "Balbir Kumar, Shail.B.Jain, and Page: 136]

Input Impedance Zi o Zi = RG

Output Impedance Zo