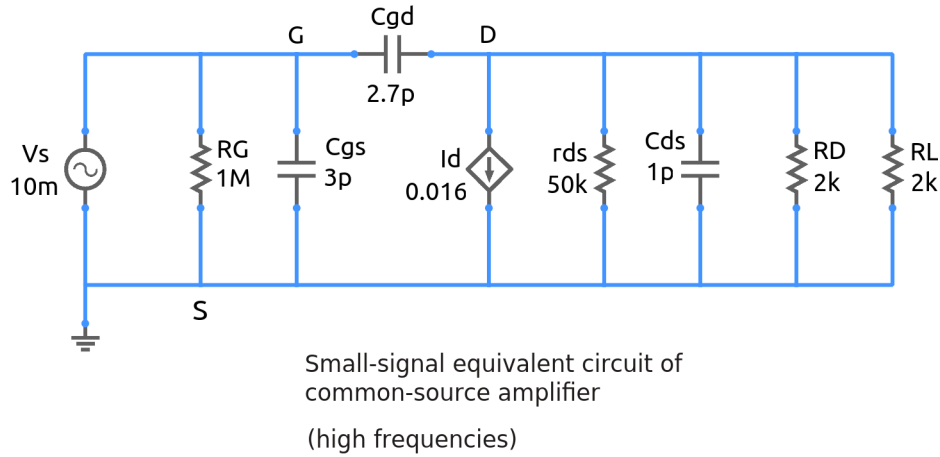


cs\_amp\_1.sqproj



A representative small-signal equivalent circuit of a common-source amplifier is shown in the figure. The coupling and bypass capacitors are not shown (they are assumed to be short circuits since we are considering high frequencies).

## Exercise Set

1. For the component values given in the figure, calculate the mid-band gain  $A_V (= v_o/v_s)$ . Verify with simulation.
2. Plot the frequency response (i.e., gain versus frequency on log-log scale). By changing the capacitance values  $C_{gs}$ ,  $C_{gd}$ ,  $C_{ds}$  one at a time, find out which capacitance is playing a dominant role in determining the high-frequency response of the amplifier. Explain your observations.

## References

1. A. S. Sedra, K. C. Smith, and A. N. Chandorkar, *Microelectronic Circuits: Theory and Applications*, Fifth edition, Oxford University Press, 2009.
2. P. R. Grey and R. G. Meyer, *Analysis and Design of Analog Integrated Circuits*, John Wiley and Sons, 1995.