mos_iv_1.sqproj
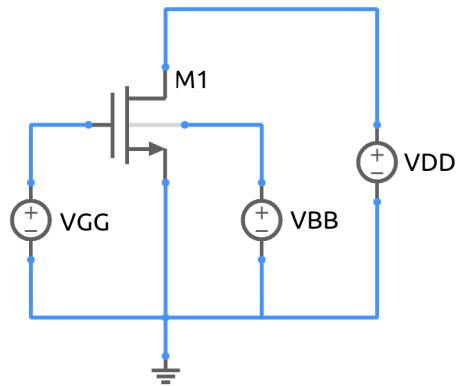

Shown in the figure is a simulation set-up for plotting the I-V curves of an n-channel MOS transistor. The source terminal is treated as the reference. For convenience, three solve blocks have been set up which can be used as follows.

1. Solve block 1 can be used to plot I_D-V_D characteristics of the transistor for different values of V_G, with V_B held constant at $V_B = 0$ V.

2. Solve block 2 can be used to plot I_D-V_G characteristics of the transistor for different values of V_B, with V_D held constant at $V_D = 0.1$ V.

3. Solve block 3 can be used to plot I_D-V_G characteristics of the transistor for different values of V_B, with V_D held constant at $V_D = 5$ V.

Exercise Set

1. Run the simulation. Plot the I-V characteristics mentioned in the above list.

2. What would be the effect changing the following parameters on the I-V characteristics?

   (a) W, (b) L, (c) threshold voltage, (d) mobility.

   Run the simulation by systematically changing (one at a time) the above parameters, and compare the I-V curves with the original curves.

References

1. B.G. Streetman and S.K. Banerjee, *Solid State Electronic Devices,* Pearson Education, 2006.

2. N. Dasgupta and A. Dasgupta, *Semiconductor Devices Modelling and Technology,* Prentice-Hall of India, 2004.