diode_iv.sqproj

Description

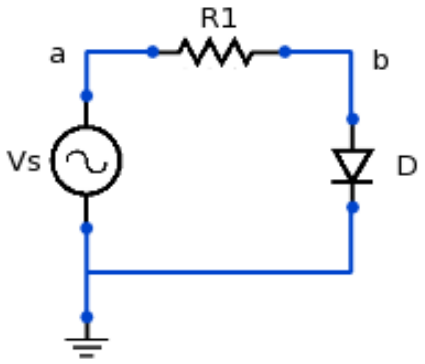
The SPICE diode model is based on the Shockley diode equation [1]. The saturation current I_s is a key parameter in deciding the diode current.

Exercise

Simulate the circuit shown in the figure, and plot I_D versus V_D, i.e., the diode $I-V$ characteristic.

(a) Change I_s by a factor of 2, 5, 10, and see its effect on the $I-V$ characteristic.

(b) Simulate the circuit at $T = 300\,K$, $320\,K$, $350\,K$. How does the $I-V$ curve change? Explain the results on the basis of the Shockley equation.



References:

1. P. Antognetti and G. Massabrio, *Semiconductor device modeling with SPICE,* McGraw-Hill: New York, 1988.