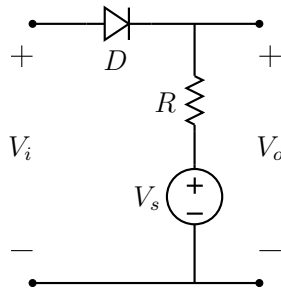


ee101_diode_clipper_2.sqproj



In the series clipper circuit shown in the figure, V_s is a DC voltage. The diode conducts if $V_i > V_s + V_{\text{on}}$, where $V_{\text{on}} \approx 0.7\text{ V}$ for a silicon diode. In this case, the output voltage is $V_o = V_i - V_{\text{on}}$. For $V_i < V_s + V_{\text{on}}$, the diode does not conduct, there is no voltage drop across R , and $V_o = V_s$.

The V_o versus V_i characteristic for this circuit can be obtained by

- (a) applying a DC voltage at the input, varying it from V_{start} to V_{end} , and plotting V_o versus V_i , or
- (b) applying a periodic input voltage (say, a sinusoidal or triangular voltage), simulating for one cycle, and then plotting $V_o(t)$ versus $V_i(t)$.

Exercise Set

1. For $-5\text{ V} < V_i < 5\text{ V}$, sketch V_o versus V_i for $R = 1\text{ k}\Omega$ and $V_s = +2, 0, -2\text{ V}$. Verify your result with simulation in each case.
2. Sketch $V_o(t)$ for the three cases in (1) if $V_i(t)$ is a triangular voltage going from -5 V to 5 V , with frequency $f = 100\text{ Hz}$. Verify by simulation.