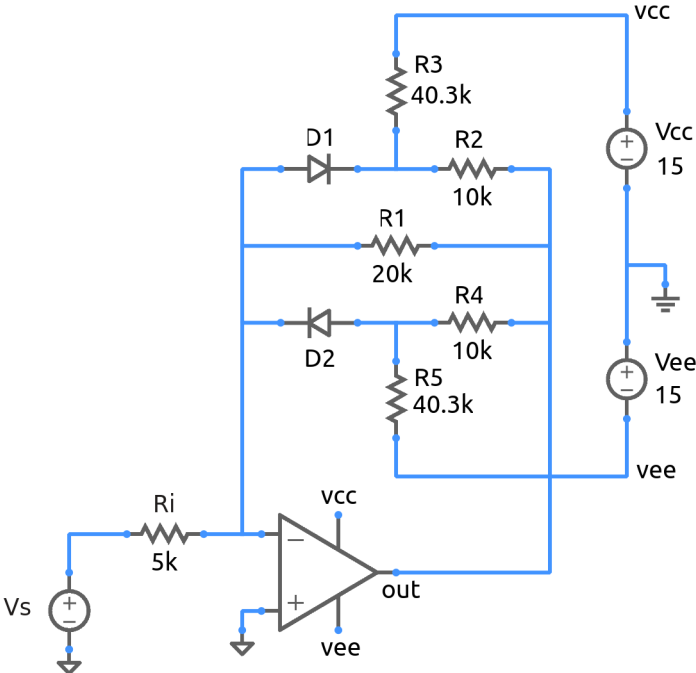


wave_shaper_1.sqproj



Fiore: Op Amps and Linear Integrated Circuits

Figure 1: A wave shaping circuit.

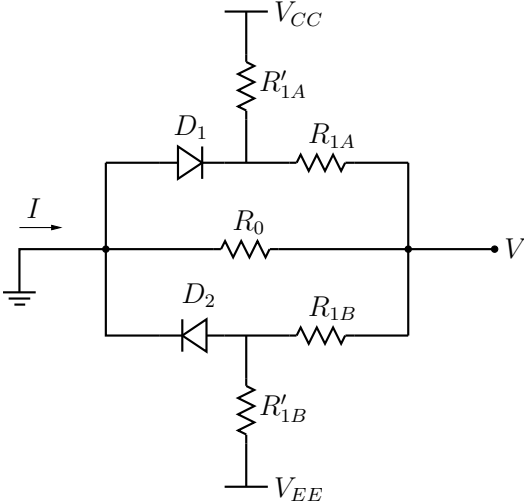


Figure 2: Wave shaping network.

A simple wave shaping circuit is shown in Fig. 1. It is essentially an inverting amplifier circuit with the feedback resistor replaced by the diode network. The operation of the circuit can be

understood in terms of the I - V relationship of the diode network (see Fig. 2). Consider $V > 0$, V. When V is small, the diodes are off, and the current I is given by $-V/R_0$. As V is increased, D_2 turns on at some point, causing a change in the I versus V curve. A similar transition happens when D_1 turns on with $V < 0$ V.

Exercise Set

1. Work out the I - V relationship for the diode network in Fig. 2.
2. Simulate the circuit, and plot V_o versus V_i . Relate this plot to the I - V relationship you have worked out for the diode network.
3. Simulate the circuit, and plot V_i and V_{out} versus time. Relate this plot to the V_o versus V_i plot.

References

1. J. M. Fiore, *Op Amps and Linear Integrated Circuits*, Delmar, 2001.