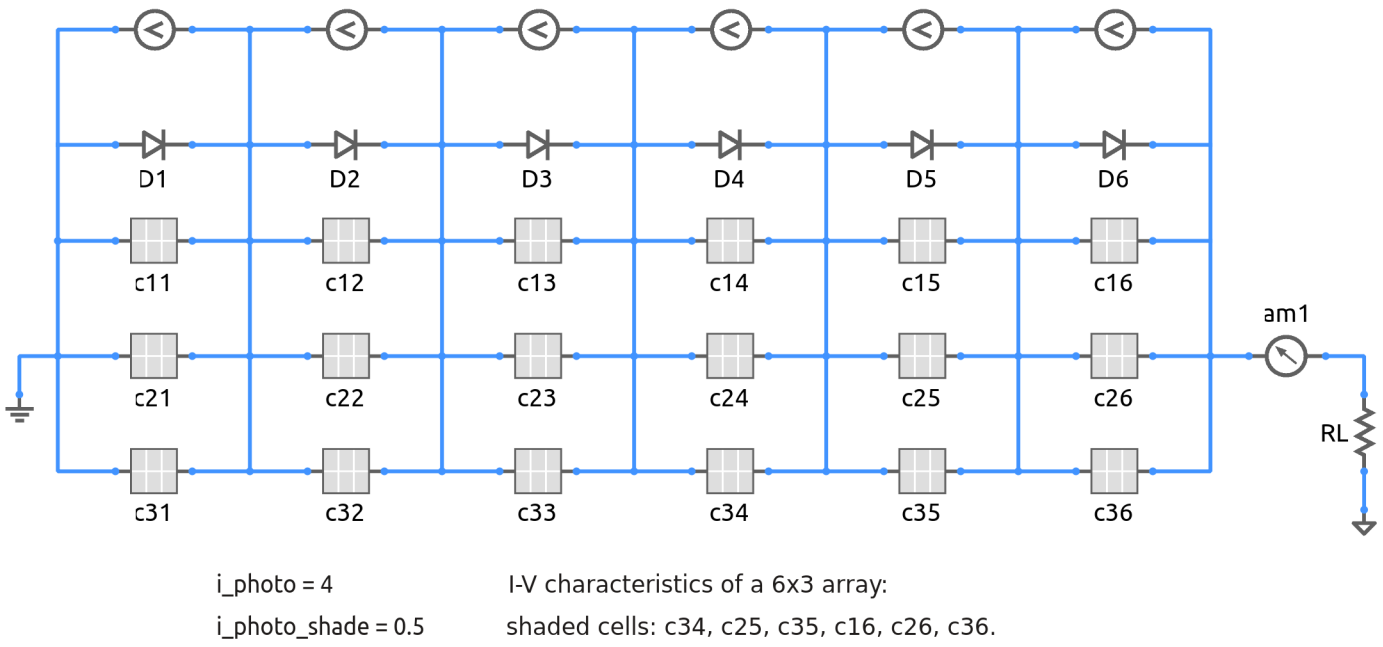
solar_iv_6.sqproj



Shown in the figure is an array of solar cells connected in a series-parallel network, with one bypass diode for three cells. Six of the cells are under shade, and their photocurrent is reduced from 4 A to 0.5 A. All other cells have a photocurrent of $I_p = 4$ A.

Exercise Set

1. Plot (on paper) the I-V relationship for the array in two cases: (a) The above condition, (b) All photocurrents are equal (4 A).

   Note: A critical examination of `solar_iv_5a.sqproj` will be helpful.

2. Plot the bypass diode currents (I_{D1},$\cdots$,I_{D6}) versus the total voltage drop for the condition described above.

3. Plot the cell voltages (as the voltmeters shown in the figure would measure) versus the total voltage drop for the condition described above.

4. Compare your plots with simulation results.

References

1. L. Castaner and S. Silvestre, *Modelling Photovoltaic Systems with PSpice,* John Wiley and Sons, 2002.

2. C. S. Solanki, *Solar Photovoltaics: Fundamentals, Technologies, and Applications,* Prentice-Hall India, 2011.