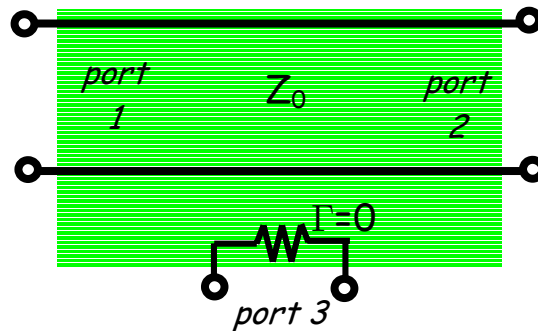


Special Problem II.A-24

Recall that we considered in class this three-port device:



We decided that the first column of its scattering matrix was identical to a **circulator**, i.e.:

$$|S_{11}|^2 = 0 \quad |S_{21}|^2 = 1 \quad |S_{31}|^2 = 0$$

Determine the magnitude of the remaining scattering parameters for this device (i.e., $|S_{12}|^2$, $|S_{22}|^2$, $|S_{32}|^2$, $|S_{13}|^2$, $|S_{23}|^2$, $|S_{33}|^2$)

Is this device matched? lossless? reciprocal?