Two port networks

\[ A_y = \begin{vmatrix} y_{11} & y_{12} \\ y_{21} & y_{22} \end{vmatrix} \]

\[ I_1 = y_{11}V_1 + y_{12}V_2 \]
\[ I_2 = y_{21}V_1 + y_{22}V_2 \]

\[ A_y = \frac{I_2}{V_1} \] when \( V_2 = 0 \)

\[ A_i = \begin{vmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{vmatrix} \]

\[ V_1 = h_{11}I_1 + h_{12}V_2 \]
\[ I_2 = h_{21}I_1 + h_{22}V_2 \]

\[ A_i = \frac{I_2}{I_1} \] when \( V_2 = 0 \)

\[ A_z = \begin{vmatrix} z_{11} & z_{12} \\ z_{21} & z_{22} \end{vmatrix} \]

\[ V_1 = z_{11}I_1 + z_{12}I_2 \]
\[ V_2 = z_{21}I_1 + z_{22}I_2 \]

\[ A_z = \frac{V_2}{I_1} \] when \( I_2 = 0 \)

\[ A_v = \begin{vmatrix} g_{11} & g_{12} \\ g_{21} & g_{22} \end{vmatrix} \]

\[ I_1 = g_{11}V_1 + g_{12}I_2 \]
\[ V_2 = g_{21}V_1 + g_{22}I_2 \]

\[ A_v = \frac{V_2}{V_1} \] when \( I_2 = 0 \)
In most cases there is no backward transmission: \( y_{12} = z_{12} = h_{12} = g_{12} = 0 \)