Parameters for Example 3.7.2

$j := \sqrt{-1}$ $dB := 1$ $G_P := 10 \cdot dB$

$M := \begin{bmatrix} 0.500 & 0.080 \\ 2.500 & 0.800 \end{bmatrix}$ $\phi := \begin{bmatrix} -180 \cdot deg & 30 \cdot deg \\ 70 \cdot deg & -100 \cdot deg \end{bmatrix}$ $m := 1 .. 2$ $n := 1 .. 2$ $S_{m,n} := M_{m,n} \cdot e^{j \cdot (\phi_{m,n})}$

$\Delta := S_{1,1} \cdot S_{2,2} - S_{2,1} \cdot S_{1,2}$ $|\Delta| = 2.228 \cdot 10^{-1}$ $\arg(\Delta) = 6.212 \cdot 10^{1} \cdot deg$

$K := \left[\frac{1 - (|S_{1,1}|)^2 - (|S_{2,2}|)^2 + (|\Delta|)^2}{2 \cdot |S_{1,2} \cdot S_{2,1}|} \right]$ $K = 3.991 \cdot 10^{-1}$ $g_p := \frac{10^{(.1 \cdot G_P)}}{(|S_{2,1}|)^2}$ $g_p = 1.6$

$r_L := \left| \frac{S_{1,2} \cdot S_{2,1}}{(|S_{2,2}|)^2 - (|\Delta|)^2} \right|$ $r_L = 3.388 \cdot 10^{-1}$ $C_L := \frac{\overline{(S_{2,2} - \Delta \cdot \overline{S_{1,1}})}}{\left[(|S_{2,2}|)^2 - (|\Delta|)^2 \right]}$ $|C_L| = 1.177$ $\arg(C_L) = 9.718 \cdot 10^{1} \cdot deg$

$r_p := \frac{\sqrt{1 - 2 \cdot K \cdot |S_{1,2} \cdot S_{2,1}| \cdot g_p + (|S_{1,2} \cdot S_{2,1}|)^2 \cdot g_p^2}}{\left| 1 + g_p \cdot \left[(|S_{2,2}|)^2 - (|\Delta|)^2 \right] \right|}$ $r_p = 4.733 \cdot 10^{-1}$

$$C_p := \frac{g_p \cdot \overline{S_{2,2} - \Delta \cdot \left(\overline{S_{1,1}}\right)}}{1 + g_p \cdot \left[\left(\left| S_{2,2} \right| \right)^2 - \left(\left| \Delta \right| \right)^2 \right]} \qquad \left| C_p \right| = 5.717 \cdot 10^{-1} \qquad \arg\left(C_p\right) = 9.718 \cdot 10^{1} \cdot \text{deg}$$

$$\theta := -82.8 \cdot \text{deg} \qquad \Gamma_L := C_p + r_p \cdot e^{j \cdot \theta} \qquad \left| \Gamma_L \right| = 9.843 \cdot 10^{-2} \qquad \arg\left(\Gamma_L\right) = 9.708 \cdot 10^{1} \cdot \text{deg}$$

$$\Gamma_{in} := S_{1,1} + \frac{S_{2,1} \cdot S_{1,2} \cdot \Gamma_L}{1 - S_{2,2} \cdot \Gamma_L} \qquad \left| \Gamma_{in} \right| = 5.205 \cdot 10^{-1} \qquad \arg\left(\Gamma_{in}\right) = -1.793 \cdot 10^{2} \cdot \text{deg} \qquad \Gamma_s := \overline{\Gamma_{in}}$$

$$Mag\_\Gamma_a := \left| \frac{\Gamma_{in} - \overline{\Gamma_s}}{1 - \Gamma_{in} \cdot \Gamma_s} \right| \qquad Mag\_\Gamma_a = 0 \qquad VSWR_{in} := \frac{1 + Mag\_\Gamma_a}{1 - Mag\_\Gamma_a} \qquad VSWR_{in} = 1$$

$$\Gamma_{out} := S_{2,2} + \frac{S_{2,1} \cdot S_{1,2} \cdot \Gamma_s}{1 - S_{1,1} \cdot \Gamma_s} \qquad \left| \Gamma_{out} \right| = 9.341 \cdot 10^{-1} \qquad \arg\left(\Gamma_{out}\right) = -9.718 \cdot 10^{1} \cdot \text{deg}$$

$$Mag\_\Gamma_b := \left| \frac{\Gamma_{out} - \overline{\Gamma_L}}{1 - \Gamma_{out} \cdot \Gamma_L} \right| \qquad Mag\_\Gamma_b = 9.203 \cdot 10^{-1} \qquad VSWR_{out} := \frac{1 + Mag\_\Gamma_b}{1 - Mag\_\Gamma_b} \qquad VSWR_{out} = 2.41 \cdot 10^{1}$$

$$G_P := \left[\frac{1}{\left[1 - \left|\Gamma_{in}\right|^2\right]}\right] \cdot \left|S_{2,1}\right|^2 \cdot \left[\frac{1 - \left|\Gamma_L\right|^2}{\left|1 - S_{2,2}\cdot\Gamma_L\right|^2}\right] \qquad G_P = 10 \qquad G_{P\_dB} := 10\cdot\log\left(G_P\right) \qquad G_{P\_dB} = 10\,\circ dB$$

$$G_T := \left[\frac{1 - \left|\Gamma_s\right|^2}{\left|1 - \Gamma_{in}\cdot\Gamma_s\right|^2}\right] \cdot \left|S_{2,1}\right|^2 \cdot \left[\frac{1 - \left|\Gamma_L\right|^2}{\left|1 - S_{2,2}\cdot\Gamma_L\right|^2}\right] \qquad G_T = 1\cdot 10^1 \qquad G_{T\_dB} := 10\cdot\log\left(G_T\right) \qquad G_{T\_dB} = 1\cdot 10^1\,\circ dB$$