三.

(1) $[S] = \begin{bmatrix} 0.6j & 0.8 \\ 0.8j & 0.6 \end{bmatrix}$

$\rho = \dfrac{1+|S_{11}|}{1-|S_{11}|} = \dfrac{1.6}{0.4} = 4$

输出端口接匹配负载. $a_2 = 0$.

$S_{11}' = S_{11} e^{-j2\beta\delta}$

当 $\delta = \dfrac{3}{8}\lambda$ 时, $S_{11min}' = -0.6$

(3) 仅移动输出端面

$S_{11}' = S_{11} = 0.6j$

$S_{21}' = S_{21} \cdot e^{-j\beta l_2} = 0.8j$

$\therefore e^{-j\beta l_2} = j$

$l_2 = \dfrac{3}{4}\lambda$

$S_{12}' = S_{12} \cdot e^{-j\beta l_2} = 0.8j$

$S_{22}' = S_{22} \cdot e^{-j2\beta l_2} = 0.6j$

$\therefore [S'] = \begin{bmatrix} 0.6j & 0.8j \\ 0.8j & 0.6j \end{bmatrix}$

(2) $L = \dfrac{1}{|S_{12}|^2} = \dfrac{1}{0.8^2} \dfrac{1}{0.64} = 1.5625$

$\phi = \theta_{21} = 0$.

$[S]^+ [S] = \begin{bmatrix} -0.6j & 0.8 \\ 0.8 & -0.6j \end{bmatrix} \begin{bmatrix} 0.6j & 0.8 \\ 0.8 & 0.6j \end{bmatrix}$

$= [1]$.   故无耗.