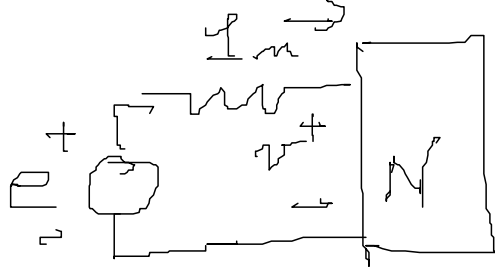


$$\int \varepsilon(\omega) = 0$$

all energy



sent into R

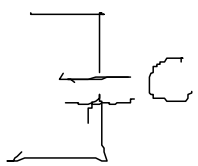
came back out and gets dissipated

in the terminating $R = 1 \Omega$, all

this lossless, $\Rightarrow 1 = \|S_{ij}(\omega)\|^2$

$$1_n = S^{T*}(j\omega) \cdot S(j\omega) = S^T(-j\omega) S(j\omega)$$

for real components



$Y(s) = sC$ pole at ∞ on $j\omega$ axis

$S(s) = \frac{1-sC}{1+sC}$ no pole on $j\omega$ axis

passive if $C > 0$, $S(s)$ pole @ $-\frac{1}{C}$

$$S(j\omega) = \frac{1-j\omega C}{1+j\omega C} ; S^*(j\omega) \cdot S(j\omega) = 1 = \|S_{ij}(\omega)\|^2$$

$$\frac{Y(j\omega) + Y^*(j\omega)}{2} = \text{Re } Y(j\omega)$$

$$\Rightarrow \frac{j\omega C - j\omega C}{2} = 0$$