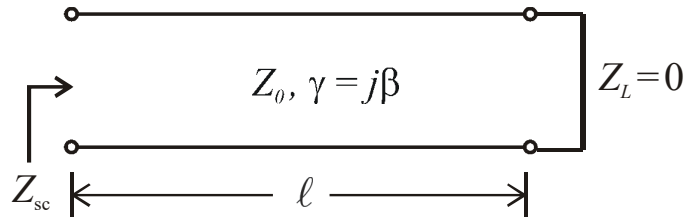


## Lossless Transmission Line Circuit Elements

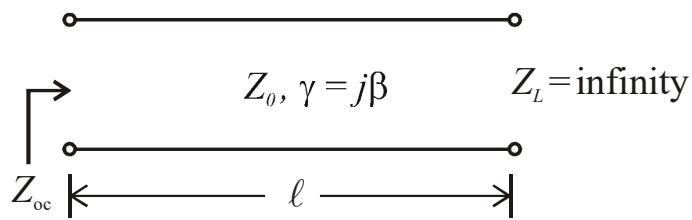
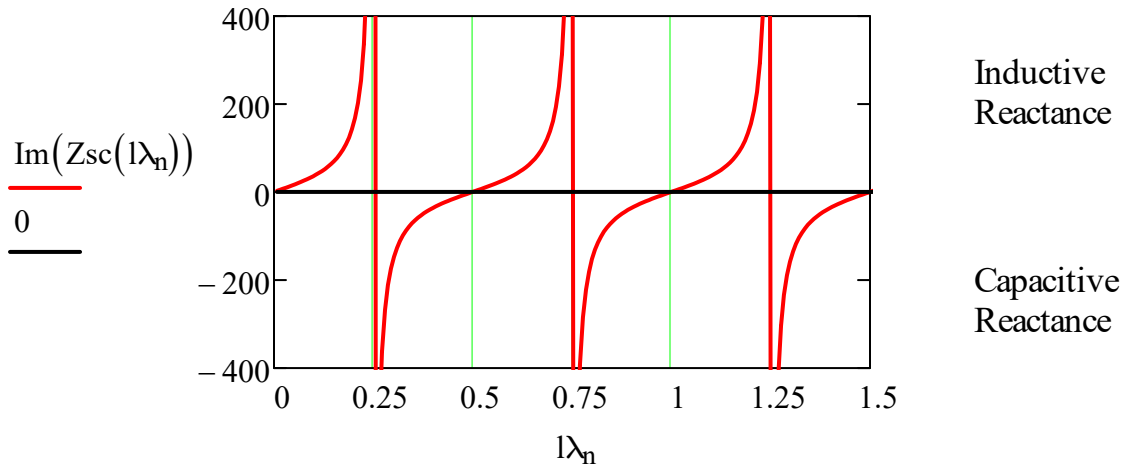
$$Z_0 := 50 \ \Omega \quad Z_{sc}(x) := j \cdot Z_0 \cdot \tan(2 \cdot \pi \cdot x) \quad Z_{oc}(x) := \frac{Z_0}{(j \cdot \tan(2 \cdot \pi \cdot x))}$$

$$n := 1 \dots 200 \quad \delta := 0.01 \quad l\lambda_n := \frac{1.5 + \delta}{200} \cdot n$$

Note:  $l/\lambda = 0.25$  is equivalent to an electrical length  $\beta l = \pi/2 = 90$  deg.



Short Circuit Stub



Open Circuit Stub

