

$$2. \quad Z_{i0c} = jX_{i0c} = -jZ_0 \cot \beta l = -j50 (\Omega)$$

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$$l = 2lm$$

$$Z_{isc} = jX_{isc} = jZ_0 \tan \beta l = j200 (\Omega)$$

$$Z_0 = \sqrt{Z_{i0c} \cdot Z_{isc}} = \sqrt{-j50 (j200)} = 100 (\Omega)$$

$$\gamma = j\beta = j \frac{1}{2} \tan^{-1} \sqrt{\frac{200}{-50}} = j \frac{1}{2} \tan^{-1} 2 = j0.554 \text{ (rad/m)}$$

$$l = 4.0 \text{ (m)} \Rightarrow j\beta l = j0.554 \times 4.0 = j2.216 \text{ (rad)}$$

$$Z_{isc} = j100 \tan 2.216\pi = j100 \tan 127^\circ = j100 (-1.31104) = -j132.104 (\Omega)$$