$$z_L = \frac{Z_L}{Z_c} = \frac{10}{50} = 0.2$$

$$z_{in}(L) = \frac{0.2 - j\tan\left(\left(\frac{2\pi}{\lambda}\right)\frac{3\lambda}{8}\right)}{1 + j0.2\tan\left(\frac{2\pi}{\lambda}\left(\frac{3\lambda}{8}\right)\right)} = \frac{0.2 - j\tan\left(\frac{3\pi}{4}\right)}{1 + j0.2\tan\left(\frac{3\pi}{4}\right)}$$

$$= \frac{0.2 + j}{1 - j0.2}$$

$$= \frac{0.2 + j\,(1 + j0.2)}{1 - j0.2\,(1 + j0.2)}$$

$$= \frac{0.2 + j0.04 + j - 0.2}{1 + 0.04}$$

$$= \frac{j1.04}{1.04} = j$$

$$\text{Normalized} = \frac{j}{50} = 0.02j$$