Suppose vacuum permittivity and permeability are ε_0 and μ_0 respectively.

(1) The capacitance per length is $C' = \varepsilon_0 \frac{w}{d}$, the inductance per length is $L' = \mu_0 \frac{d}{w}$. Then the characteristic impedance is $Z_0 = \sqrt{\frac{L'}{C'}} = \sqrt{\frac{\mu_0}{\varepsilon_0}} \frac{d}{w} = 94.25\Omega$.

The wavelength is $\lambda = \frac{c}{f} = 0.1667m$, the wavenumber is $\beta = \frac{2\pi}{\lambda} = 37.7\,/m$. The phase velocity is $u_p = c = 3\times 10^8 m/s$.

(2) The general phasor forms are:

$$\begin{cases} \tilde{V}(z) = \left|V_0^+\right| e^{j\phi^+} e^{-j\beta z} + \left|V_0^-\right| e^{j\phi^-} e^{j\beta z} \\ \tilde{I}(z) = \frac{\left|V_0^+\right| e^{j\phi^+} e^{-j\beta z}}{Z_0} - \frac{\left|V_0^-\right| e^{j\phi^-} e^{j\beta z}}{Z_0} \end{cases},$$

which in the time domain are

$$\begin{cases} V(z,t) = \left|V_0^+\right| \cos(\omega t - \beta z + \phi^+) + \left|V_0^-\right| \cos(\omega t + \beta z + \phi^-) \\ I(z,t) = \frac{\left|V_0^+\right| \cos(\omega t - \beta z + \phi^+)}{Z_0} - \frac{\left|V_0^-\right| \cos(\omega t + \beta z + \phi^-)}{Z_0} \end{cases}$$

(3) The reflection coefficient at z = 0 is $\Gamma = \frac{Z_L - Z_0}{Z_L + Z_0} = 1$, where $Z_L = \infty$ is the open-circuited impedance. The current at $z = 0$ must be zero, i.e. $\tilde{I}(0) = 0$.

(4) The reflection coefficient $\Gamma(z) = \Gamma e^{-j2\beta z}$, then the reflection coefficient at $z = z_1$ is $\Gamma(z) = \Gamma e^{-j2\beta z_1} = e^{-j0.72\pi}$.

(5) Since the transmission line is open-circuited, the current at z = 0 is zero. Then the phasor forms are:

$$\begin{cases} \tilde{V}(z) = V_0^+ \left(e^{-j\beta z} + e^{j\beta z}\right) = 2V_0^+ \cos(\beta z) \\ \tilde{I}(z) = \frac{V_0^+}{Z_0} \left(e^{-j\beta z} - e^{j\beta z}\right) == -2jV_0^+ \sin(\beta z) \end{cases}$$

Using $\tilde{I}(z_1) = 2e^{j\pi/4} A$, we can calculate

$$\begin{cases} \tilde{V}(z) = 208 e^{j3\pi/4} \cos(\beta z)\, V \\ \tilde{I}(z) = 2.2 e^{j\pi/4} \sin(\beta z)\, A \end{cases}$$

It follows that $\tilde{I}(0) = 0, \tilde{V}(0) = 208.32 e^{j3\pi/4} V$, and $\tilde{V}(z_1) = 88.7 e^{j3\pi/4} V$.