電磁波與天線導論HW8

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1

$$T = \frac{l}{c} = 2(ns)$$

$$\Gamma_L = \frac{R_L - Z_0}{R_L + Z_0} = -0.6$$

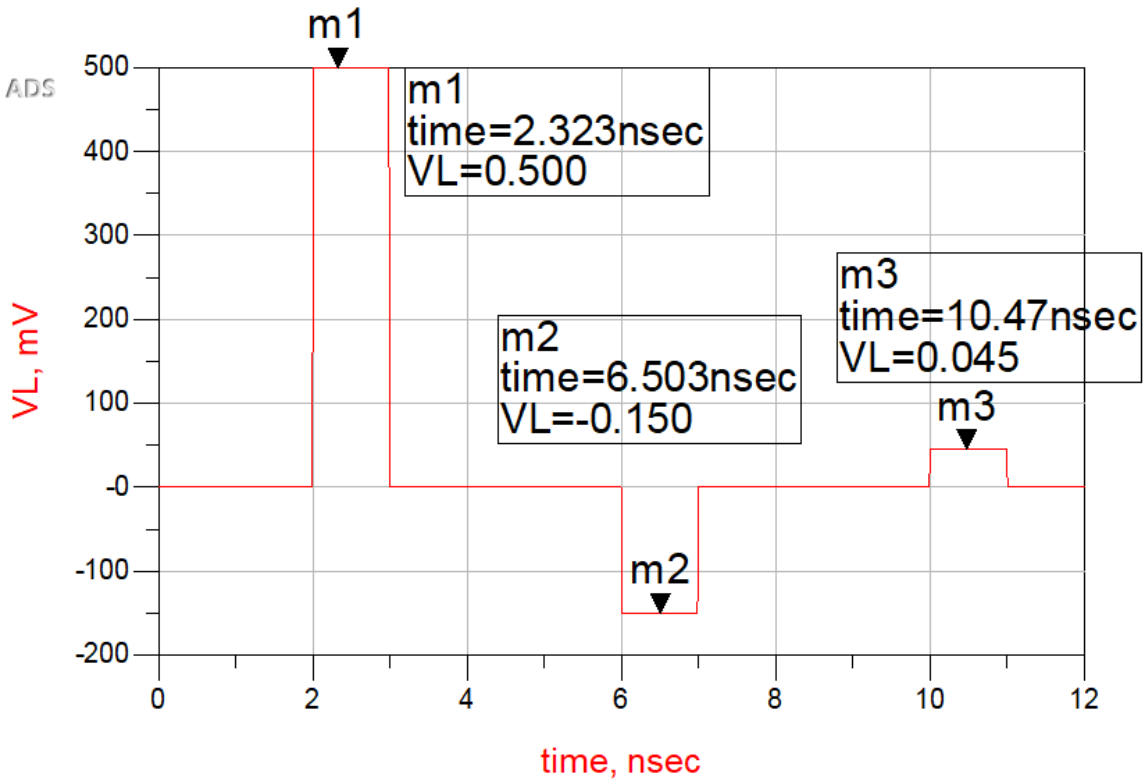
$$\Gamma_g = \frac{R_g - Z_0}{R_g + Z_0} = 0.5$$

$$V_1^+ = \frac{V_{in} * Z_0}{R_g + Z_0} = 1.25(V)$$

$$V_L(t = 2 - 3(ns)) = 1.25 - 1.25 * 0.6 = 0.5$$

$$V_L(t = 5 - 6(ns)) = -0.75 * 0.5 + 0.75 * 0.5 * 0.6 = -0.15$$

$$V_L(t = 10 - 11(ns)) = 0.225 * 0.5 - 0.225 * 0.5 * 0.6 = 0.045$$



2

(a)

$$Z_L = \frac{1}{\frac{1}{100+250}+jwc} = 0.0045 - j1.061$$

$$\beta l = \frac{5\pi}{9}$$

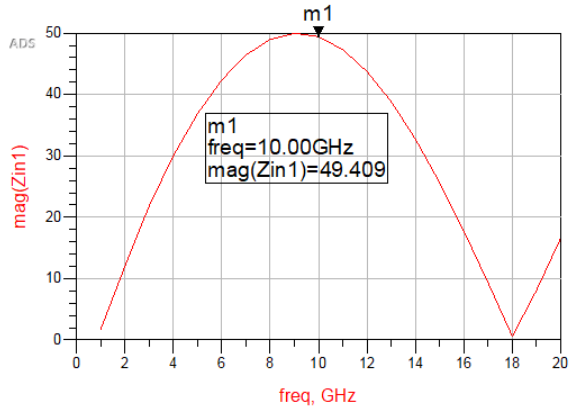
$$Z'_{in} = Z_0 \frac{Z_L + jZ_0 tan\beta l}{Z_0 + jZ_L tan\beta l} = 0.193 - j323.56$$

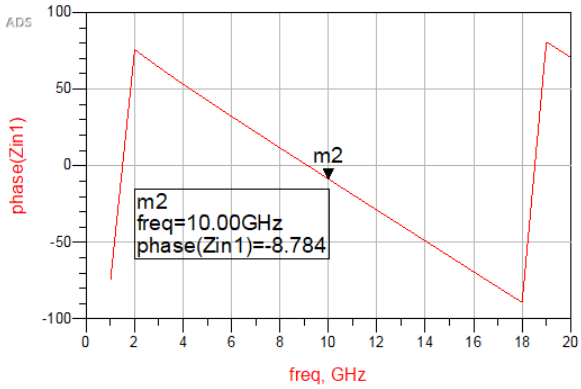
$$Z_{in} = \frac{1}{\frac{1}{Z'_{in}}+\frac{1}{50}} = 48.8296 - j7.5449 - < ans >$$

$$\Gamma_{in} = \frac{Z_{in}-Z_0}{Z_{in}+Z_0} = -0.006 - j0.0768 - < ans >$$

(b)

> Z_{in}


m1
m1
freq=10.00GHz
mag(Zin1)=49.409
mag(Zin1)
freq, GHz


m2
m2
freq=10.00GHz
phase(Zin1)=-8.784
phase(Zin1)
freq, GHz

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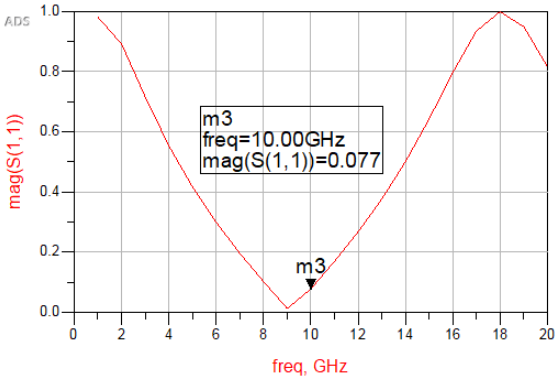
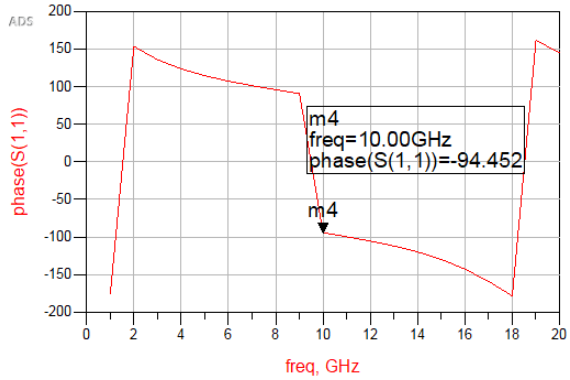

m3
freq=10.00GHz
mag(S(1,1))=0.077
m3
mag(S(1,1))
freq, GHz


m4
freq=10.00GHz
phase(S(1,1))=-94.452
m4
phase(S(1,1))
freq, GHz