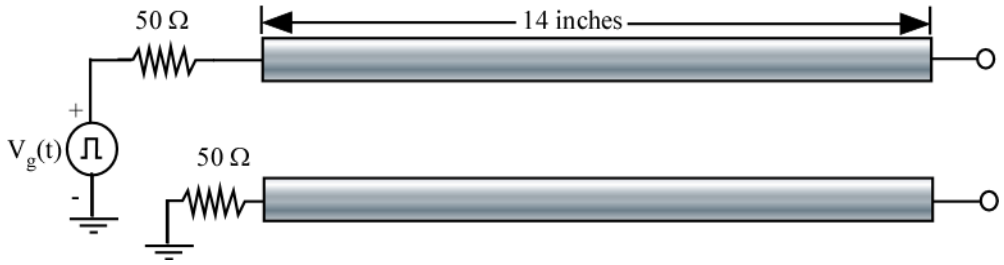
ECE 546 HOMEWORK No 5 Due Wednesday, March 2, 2016

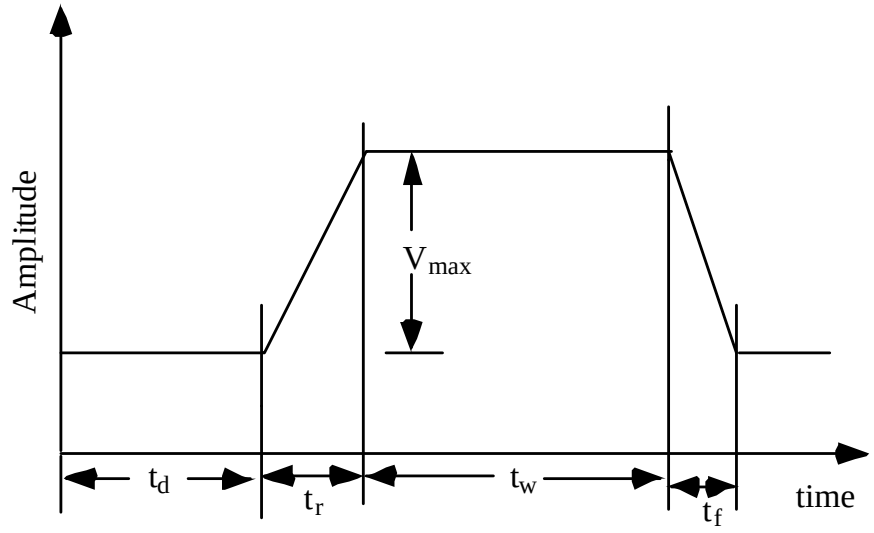
1. Write a program to simulate the response of a lossless coupled-line system with the following L and C matrices:

$$L = \begin{bmatrix} 418 & 150 \\ 150 & 418 \end{bmatrix} (nH/m) \quad C = \begin{bmatrix} 0.118 & -0.022 \\ -0.022 & 0.118 \end{bmatrix} (nF/m)$$

Test your program using the example shown below. Plot the waveforms at the near and far ends of the sense line.



The pulse characteristics for $V_g(t)$ are as shown in the figure below, with time delay: t_d = 1 ns, rise time: t_r = 1 ns, fall time: t_f = 1 ns, pulse width: t_w = 20 ns, pulse amplitude: V_{max} = 1 volt



2. Using your knowledge of multiconductor transmission lines, determine the load network that will provide an exact match to a coupled line system in terms of the even and odd-mode impedances. Compare your solution with the network in Dally & Poulton Figure 3-24 (b) (section 3.4.3). Will this network provide an exact match? Verify your results using your code from Problem 1.