# Lab #4 Pre-Lab Assignment

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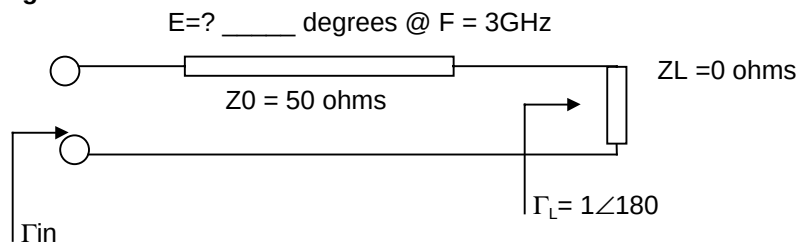
## Pre-Lab Assignment

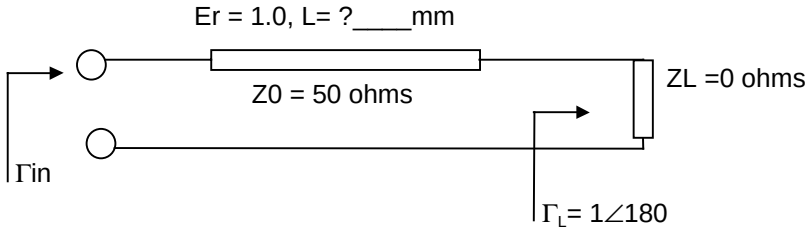
The input reflection coefficient for a 50 ohm low loss (assume lossless) transmission line terminated in a short circuit been measured at 3GHz to be
Γin **=** 1 ∠140° **.**

**A.** Fill in the blanks below to derive three different, but equivalent representations for the shorted transmission line.

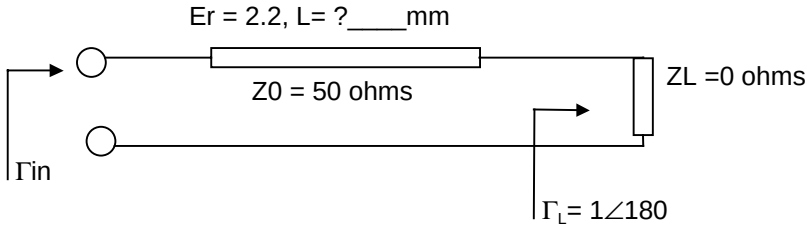
**i) Electrical length.**




**ii) Physical length, air-line**




**iii) Physical length, teflon dielectric.**



**B.** Assuming a fixed physical length, use MATHCAD to plot Γin vs. frequency on a polar chart or Smith Chart over the frequency range from 300kHz to 3000MHz for the 1-port network below. Also plot the phase of Γin on a rectangular plot over the same frequency range. [Hint: See Mathcad example from lecture and/or web page for guidance on setup of plot].