

Problem 2.52 On a lossless transmission line terminated in a load $Z_L = 100\ \Omega$, the standing-wave ratio was measured to be 2.5. Use the Smith chart to find the two possible values of Z_0 .

Solution: Refer to Fig. P2.52. $S = 2.5$ is at point $L1$ and the constant SWR circle is shown. z_L is real at only two places on the SWR circle, at $L1$, where $z_L = S = 2.5$, and $L2$, where $z_L = 1/S = 0.4$. so $Z_{01} = Z_L/z_{L1} = 100\ \Omega/2.5 = 40\ \Omega$ and $Z_{02} = Z_L/z_{L2} = 100\ \Omega/0.4 = 250\ \Omega$.

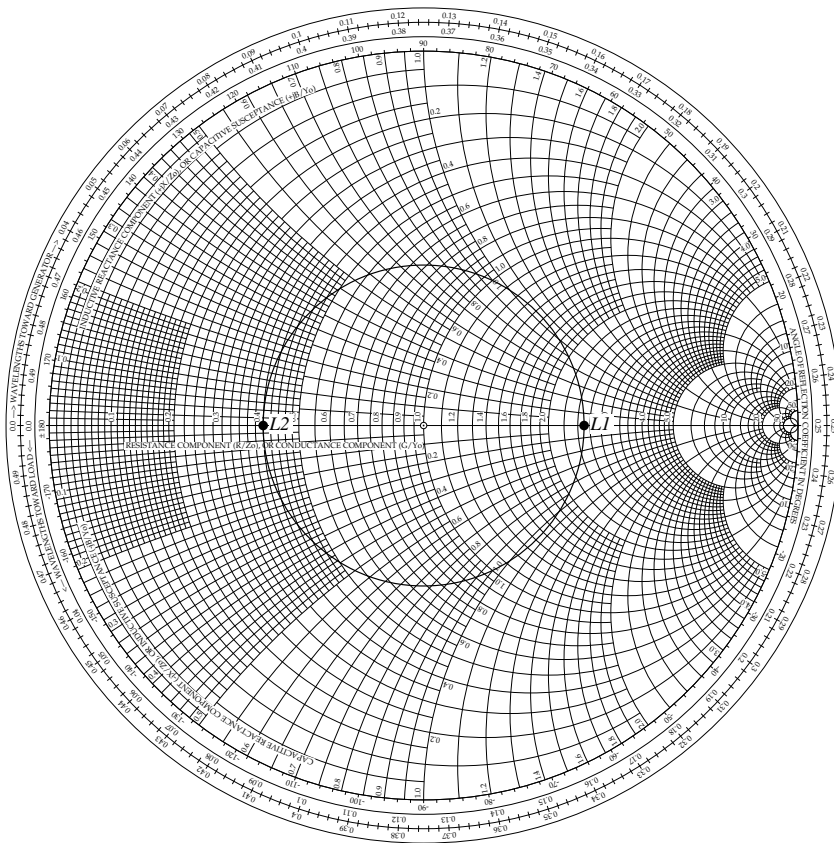


Figure P2.52: Solution of Problem 2.52.