Study Material

Text Book

Elements of Electromagnetics, 6th Ed.
Matthew N. O. Sadiku
Oxford University Press

Study Smith Charts

Read Chapter 11, pp. 554–574.
Read "Smith Charts" notes from course website.

Problems

Problem #1

At some distance away from the load along a 50 Ω transmission line, the input impedance is measured to be 50 + j50 Ω. What is the input admittance at this point? Perform the calculation by hand and by using a Smith chart.

Problem #2

A length of 50 Ω transmission line is connected to a load and the input impedance is measured to be 100 +j50 Ω. Determine the input impedance at a distance 0.2λ toward the source from this point using a Smith chart.

Problem #3

A 75 Ω transmission line is connected to a load with complex impedance of $Z_L = 22.5 + j30\ \Omega$.

Use a Smith Chart to determine the corresponding load admittance as well as the VSWR on the transmission line. Verify your results by hand.

Problem #4

A lossless transmission line has distributed parameters C = 120 pF/m and L = 300 nH/m. It operates at 10 GHz and is connected to a 6.97 pF capacitor as the load. Use a Smith chart to calculate the input impedance 5.6 mm from the load. Also determine the VSWR of the circuit. Compare your answers to results calculated by hand.