HOW TO SOLVE SMITH CHART CERTAIN PROBLEMS SPECIAL CASES OF SMITH CHART

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Q1 : Calculate Reflection Constant on Smith chart

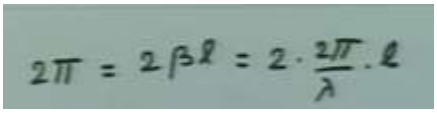
1. Get normalized impedance
2. Plot the impedance
3. Draw a line from origin to the outside of smith chart, crossing impedance.
4. Using a scale or compass note down the magnitude and angle of reflection co-efficient

Practice Question

A transmission line has a reflection coefficient of 0.6 at an angle of 45 degree. Represent the same graphically on smith chart

Q2: Find z at the distance "l" from the load

1. Get normalized impedance
2. Plot the impedance
3. Get length in term of Impedance



4. Move clock wise or anti clock wise l times and mark new impedance

Practice Question

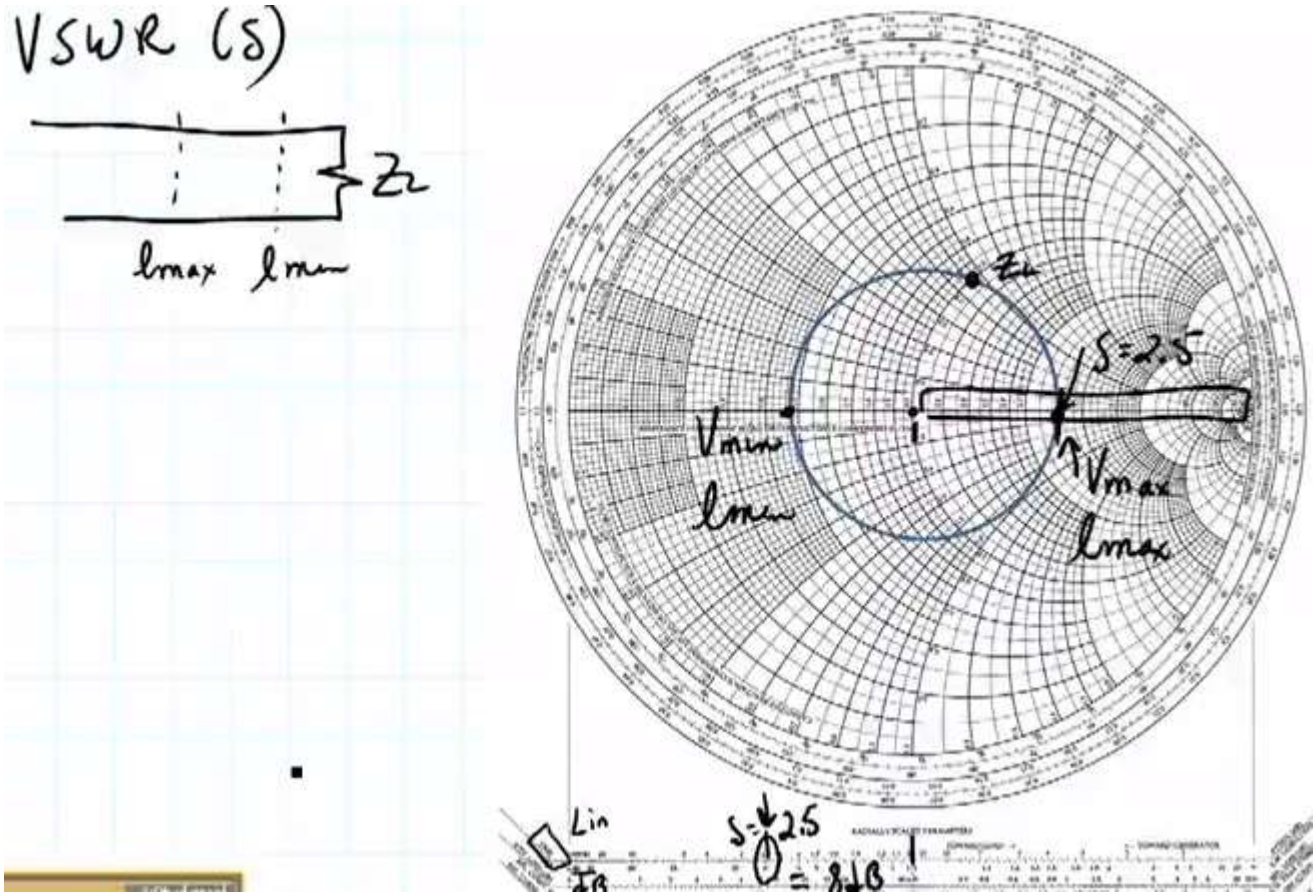
INCLUDES

How To Plot Smith Chart and Practice excercises

Q1: Show graphically Transmission co-efficient on smith chart with magnitude of 1.55 and angle of 45

Q2: A line with 50 ohm impedance has a Zl of 50+j50 . Calculate the angle of transmission and reflection coefficient. What will be the change in angle of transmission and reflection coefficient , if the resistance is increased 30 times

Q2: Find VSWR and Load Maximum and Minimum

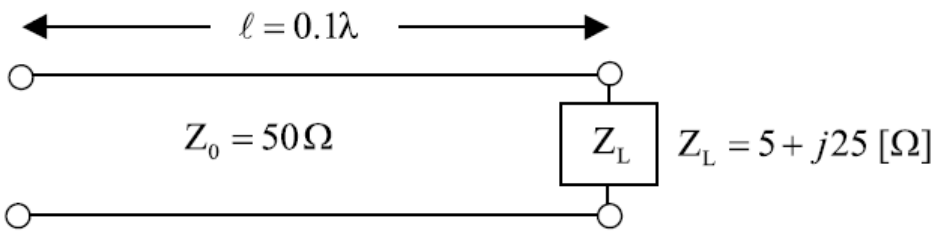


Practice Question

Q1: Calculate the new impedance for a given ZL = 100+j50, with a impedance of 50 ohm when we have moved towards the generator from load by length of .0.2 lambda .Also calculate VSWR and reflection co-efficient

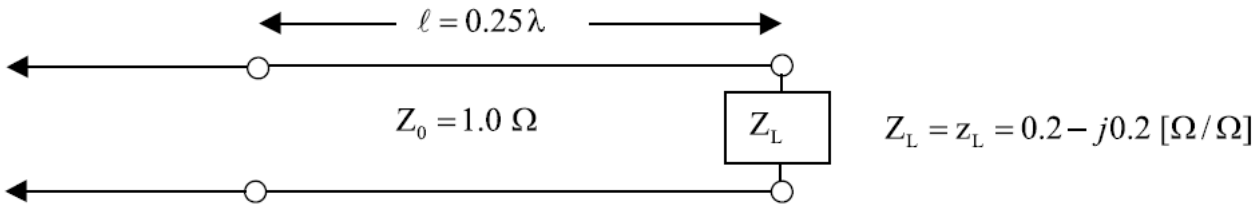
Q2. ZL and Zin are separated by a distance of 0.2 lambda. If ZL has impedance of 50+100j . What will be the Admittance and Input Load?

PRACTICE WORK SHEET



1. The 0.1λ length line shown has a characteristic impedance of 50Ω and is terminated with a load impedance of $Z_L = 5 + j25\Omega$.

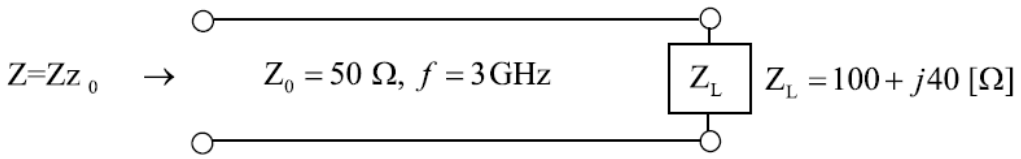
- Locate ZL
- What is the impedance at ` = 0:1 Lambda?
- Calculate VSWR and Reflection coefficient
- What is Reflection Co-efficient at ` = 0.1 lambda from the load



2. A transmission line has $Z_0 = 1.0$, $Z_L = z_L = 0.2 - j0.2\Omega$.

- What is Z at l of 0.25 lambda?

- Calculate VSWR ,
- Find Maxima and minima



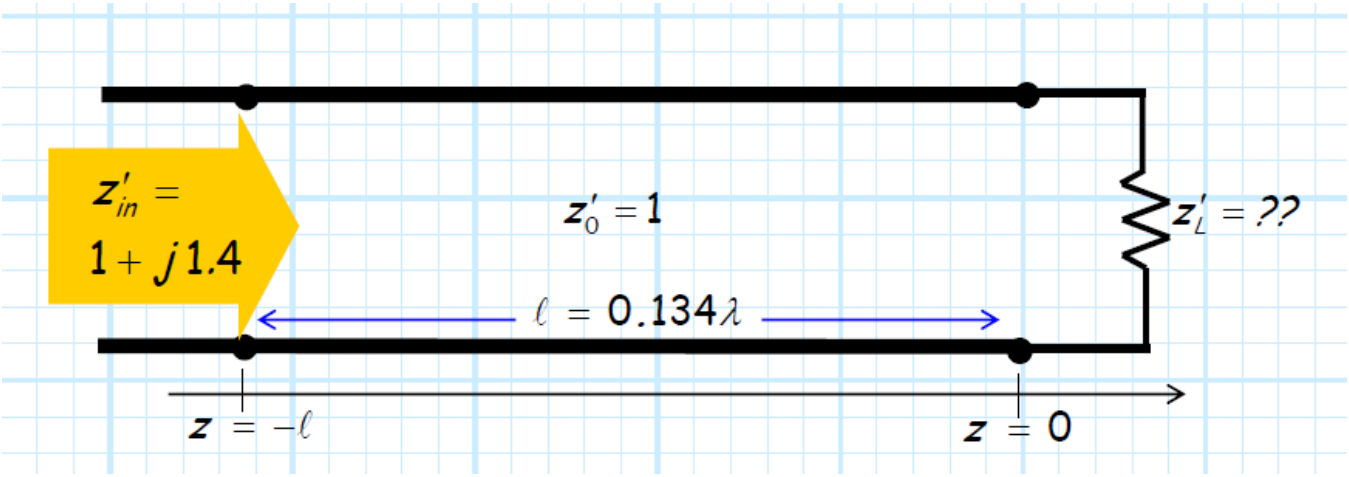
3. The air-filled two-wire line has a characteristic impedance of 50Ω and is operated at $f = 3$ GHz. The load is $Z_L = 100 + j40\Omega$.

- Find ZL
- Find Impedance at the distance of 2.5 cm from the load
- VSWR and angle of transmission

Q4: Suppose we have a transmission line with a characteristic impedance of 50 ohms and an electrical length of 0.3λ . Also, suppose we terminate this line with an impedance having a resistive component of 25 ohms and an inductive reactance of 25 ohms. What is the input impedance to the line?

Q5: A loss free transmission line of characteristic impedance 50 Ωis terminated with a real impedance of 30 + j100 Ω. If the line is lengthened by 0.093 λ, what is the value of the new termination required to ensure that the impedance seen by the generator is unchanged?

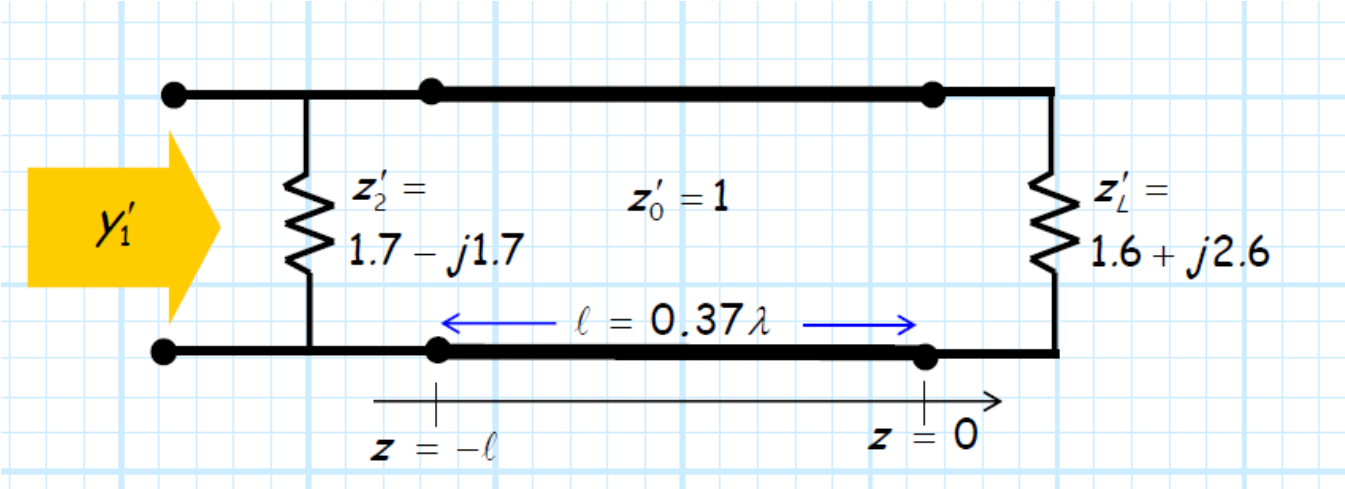
Q6 : Solve



Q7 : A load terminating at transmission line has a normalized impedance zL′ = 2.0 + j 2.0. What should the length l of transmission line be in order for its input impedance to be:

- purely real
- have a real (resistive) part equal to one

Q8 determine the normalized admittance of the network below:



Practice Questions: Pozar Uncle

2.8

2.9

2.12

2.17

2.18

2.19

2.20

2.21

Practice Questions : Uncle Peter

Example 3.6

Example 3.7

Example 3.8