**Aim**

**U19EC046 LAB 2**

Develop a Transmission Line of given determinations and figure its Characteristic Impedance for 100 MHz and 300 MHz utilizing AN-SOF Software.

**Theory**

Transmission Lines convey phone signals, PC information in LANs, TV frameworks, and signs from a transmitter to an antenna or from a antenna to a receiver. They are otherwise called circuits.

The two essential prerequisites of a transmission lines are :

1. The line ought to acquaint least weakening with the sign.
2. The line ought not emanate any of the signs as radio energy.

**Types of Transmission Lines**

* **Parallel Wire Line** is made of two parallel conductors separated by a space of 0.5 inch to several inches.
* The most widely used is the **Coaxial Cable**. It consists of a solid centre conductor surrounded by a dielectric material, usually a plastic such as a Teflon.
* **Twisted Pair Cable** uses two insulated solid copper wires covered with insulation and loosely twisted together.

**Balanced Versus Unbalanced Transmission Lines**

* Transmission Lines can be **balanced** or **unbalanced**.
* A balanced line is one in which neither wire is connected to ground.
* The signal on each wire is referenced to ground.
* In an unbalanced line, one conductor is connected to ground.
* Open wire line has a balanced configuration.

**Formulas Used**

The Specifications of the Transmission Line are :

Length of the Wire = l = 500 mm

Cross Section Radius of the Wire = a = 2 mm

Now,

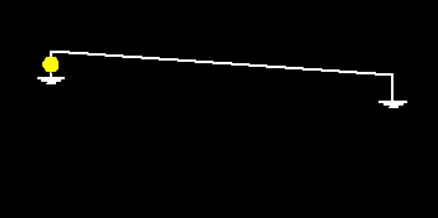
by putting for short circuit

by putting for open circuit

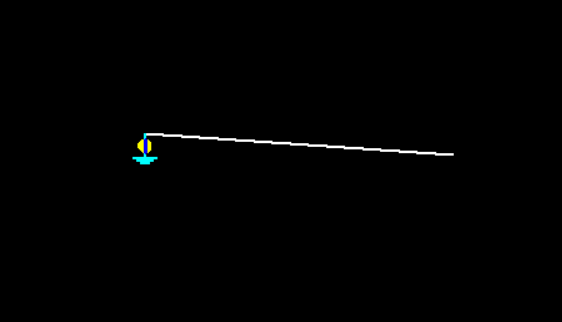
On the other hand, the relation for the Characteristic Impedance of a line above a ground plane is given by :

where h is the height of the wire from the ground, whose value for our experiment is 40 mm.

**AN-SOF Model**

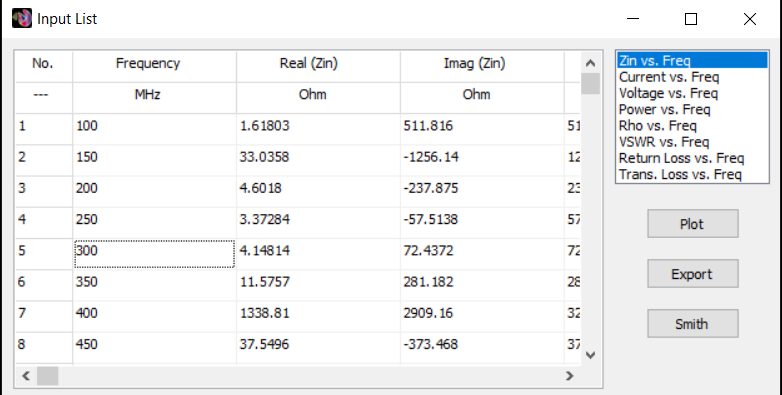


Short Circuit Configuration

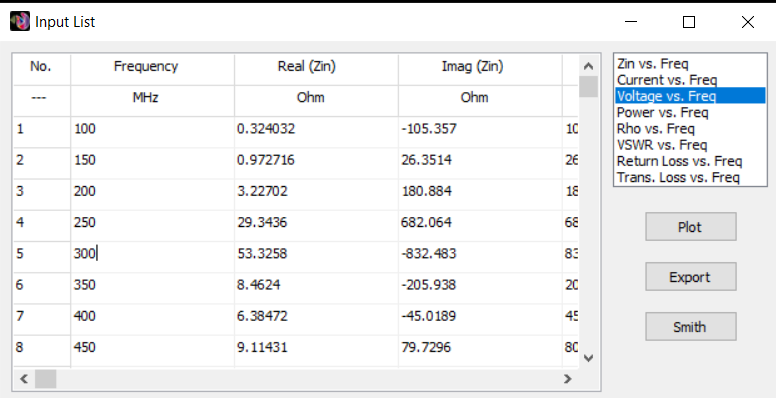


Open Circuit Configuration

**AN-SOF Output and Plots**

****

Short Circuit Output



Open Circuit Output

**Calculations**

For 100 MHz :

For 150 MHz :

For 200 MHz :

For 250 MHz :

For 300 MHz :

**Conclusion**

In the above Practical we executed a Transmission Line Wire utilizing AN-SOF Software and determined its Characteristic Impedance from the resultant plots which is extremely shut to the theoretical value of 221 Ω.