

ABSTRACT

Ground Penetrating Radar (GPR) is kind of radar that is used to detect and locate buried metal and non-metal objects. Tx antenna GPR is transmitting electromagnetic impulse so that penetrate soil and bounced by object to Rx antenna GPR. From bound wave obtainable locate information of object. From Rx antenna bound wave will be continued to amplifier. An amplifier on receiver equipments is very important. It used as power amplifier so that the power which needed is enough to could be received by receiver. But an amplifier does not only amplify the information signals, but also noise signal which is produced by the device it self. To design a simple amplifier, the maximum gain on information signals and the minimum gain on noise signals usually can not be reached together in the same time. Because of it, it should be made Low Noise Amplifier (LNA) which is a power amplifier that has high power information signal gain and low power noise signal gain, until an acceptable limited value.

In this Last assignment, it is implementation of LNA Prototype at frequency operation of GPR. This device is a stable amplifier (single class) which is designed using unstable transistor (conditioned stability), which has stability rate that must be found before using it. While to match the impedance will be realized by using lumped element (Topology π and Topology T).

To know performance of the LNA, test to compare the result of measurement with its specification have been done. The examination is done by measuring the LNA parameters like frequency region, noise figure, gain, voltage standing wave ratio (VSWR), sensitivity & threshold power of the amplifier and characteristic impedance. From result of measurement, this LNA have active at (147.28 – 219.27) MHz with gain 9.238 dB and Noise Figure 1.83 dB. This is different with design that is at 200 MHz with design gain 24.53 dB. LNA active at frequency region (147.28 – 219.27) MHz. With the result that $BW_{VSWR \leq 1.5} = 72$ MHz.

Key Word : LNA, GPR, Noise Figure, Gain, VSWR, Lumped Element