

ABSTRACT

The importance of studying climate and weather in Indonesia using instruments of weather monitoring with a wide area coverage is very necessary. The most effective weather monitoring instrument for a wide area is using radar. Weather radar is a radar that can detect rain drops with very small diameter sizes. Weather radar is also able to monitor the movement of rain and clouds. One of the obstacles faced by radar systems is reflected signals that have low power so that the reception quality is not good. To overcome this problem, the signal needs to be reinforced by a low noise amplifier (LNA) so that the signal has a large enough power level with low noise so that it can be processed by the next stage.

In this Final Project LNA is designed and realized which can work at a frequency of 5,500-5,700 Ghz. The LNA specification designed is having a gain of ≥ 20 dB and a noise figure of ≤ 5 dB. In the design and simulation of LNA, the Agilent's Advanced Design System 2015 software was used with the active component being used was BFP740 ESD from Infineon.

LNA performance testing is done by comparing the measurement data with the initial specifications of the design. The simulation results of LNA on the 5.6 GHz frequency produce a gain of 31,146, dB, noise figure 1,643 dB, while the VSWR input and VSWR output are 1,109 and 1,042. From the measurement results obtained the gain generated at the frequency of 5.6 GHz is 24.5 dB with a noise figure of 4.019 dB. VSWR input and VSWR outputs are 2,222 and 2,103. After the addition of the trimming capasitor the output of VSWR input and VSWR output is 1.442 and 1.371. Based on the measurement results of several parameters, the LNA designed has met the specifications so that it is suitable for weather radar applications at C-band frequencies of 5,500-5,700 Ghz.

Keywords: *weather radar, LNA, noise figure, gain, VSWR*