

ABSTRACT

Automatic Dependent Surveillance-Broadcast (ADS-B) is an air traffic surveillance technology that automatically and periodically broadcasts onboard aircraft flight information such as identity numbers, positions, speeds, and destinations during all phases of flight to avoid collisions. In the future, the radar system will be equipped or even replaced by the ADS-B ground station, but the ADS-B ground station receiver still has limited coverage. Therefore, the Nano Satellite Laboratory of Telkom University is developing a satellite technology called Tel-USat which is the ADS-B receiver is one of the missions for the development of Tel-USat 2. It is expected that the payload of the ADS-B signal receiver on Tel-USat 2 can reach airspace that cannot be reached by the ground station.

The ADS-B payload that will be carried by Tel-USat 2 consists of two antennas, a Low Noise Amplifier (LNA), and a payload computer. This final project focuses on the design and realization of the ADS-B data transmitter antenna which has been processed by the nanosatellite payload computer to the ground station. This antenna is designed with two substrate materials namely RT / duroid laminate 6006LM, and FR-4. Using two rectangular patches, designed using a linear array, T-junction power divider, and proximity coupled rationing.

The result of the realization on the laminate RT / duroid 6006LM substrate was obtained value of return loss at frequency 2.4 GHz was only -1.09 dB. While the realization on the FR-4 substrate obtained a return loss value -18.5 dB, VSWR 1.2, bandwidth 163 MHz, and the gain of antenna 10.68 dB at center frequency 2.4 GHz.

Keyword : ADS-B, Nanosatellite, TelUSat-2, Microstrip, Payload