

ABSTRACT

Automatic Dependent Surveillance - Broadcast (ADS-B) is an surveillance system that can periodically track positions, speeds, characteristics, weather and data. The ADS-B system uses the Global Navigation Satellite System (GNSS) technology, where the aircraft will continue to transmit information to ground station, satellite and aircraft equipped with the ADS-B system. ADS-B receiving antenna works on frequency 1090 MHz with linear polarization, because it is not affected by the Faraday extension effect. The characteristics of the ADS-B receiving antenna are high gain in order to receive information signals from the transponder to the station properly and have a radiation pattern that can be used in various directions.

In a previous study about "A compact microstrip patch antenna for ADS-B operation", was conducted with FR-4 epoxy substrate material with a relative coefficient of $(\epsilon_r) = 4.3$ and feed line rationing method. The study produced bandwidth about 300 MHz, gain about 3,01 dBi and omni directional radiation pattern.

In this final project, the design of microstrip antenna using dielectric material $(\epsilon_r) = 2,2$. To expand bandwidth, the proximity coupled method is used, the DGS (Defected Ground Structure) method and slotted patch method are used too. After simulation and measurement, we got the bandwidth value about 128 MHz with a return loss value about -14 dB and gain value about 5.2 dBi with HPBW azimuth 60° and elevation of 40° . The resulting polarization is elips and omni directional radiation pattern.

Key word: ADS-B, microstrip antenna, DGS.