Abstract

Microstrip antenna is made of three material layers, the conductor layer, a dielectric substrate, and the field of the earth. Conductors are generally made of copper, aluminum, or gold. Dielectric thickness h < λ has relative permittivity (ε_r) ranged from 2.2 to 10. Dielectric constant is made low to increase the abundance of terrain that is useful in radiation. In the analysis, the field of the earth is made of a perfect conductor, but in the application field of the earth is made of an imperfect conductor.

Microstrip antenna has several advantages, such as a compact form, small dimensions. It is easy to fabricate and to connect and integrate with other electronic devices. However, this antenna has some disadvantages, such as low gain, low efficiency, low bandwidth and occurring of surface waves.

Surface waves occur when microstrip antenna radiates waves into the air, but there are waves trapped in the substrate. This wave can reduce the antenna efficiency and gain, limit the bandwidth, improve end-fire radiation, increase cross-polarization, limit the working frequency range of microstrip antenna, and improve the mutual coupling among the stacking antenna elements that make decreasing performance of the stacking antenna.

In the final project entitled Design and Analysis Array Rectangular Microstrip Antenna with Diamond Defected Ground Structure at 3.3GHz-3.4GHz Frequency, microstrip antenna applies Defected Ground Structure (DGS). It uses the square DGS. DGS is placed on the ground plane of the substrate. Simulation and measurement results are done by comparing the performance of element two stacking antennas without and with DGS. CST software is used to laying DGS to observe the influences of DGS on the performance of stacking antenna that is made.

DGS applications results on the conventional antenna are not only pay attention to impedance bandwidth and return loss, but also improve antenna gain.

Keywords: DGS (Defected Ground Structure), adjacency effects, impedance, bandwidth, return loss, gain.