

ABSTRACT

Microstrip antennas have the advantages of small volume and low fabrication costs. Generally, in designing microstrip antennas using FR-4 Epoxy type substrates, the resulting antenna has a narrow bandwidth, decreased gain and antenna efficiency. This study observed the differences in microstrip antennas paired using 3 different types of substrates. The substrate used is FR4-Epoxy material with a permittivity of 4.3; water with a permittivity of 78; and nitrogen with a permittivity of 1. The microstrip antenna used is rectangular with a working frequency of 920 MHz. This research uses CST Studio Suite software as a simulation medium. To get the desired results requires changes to the dimensions of the ground plane, substrate, patch, stripline, addition of slots. This study shows the results that the FR-4 Epoxy substrate has a return loss value of -15.715 dB, VSWR 1.391 dB and gain of -3.309 dBi. At nitrogen the return loss value is -10.273 dB, VSWR is 1.883 dB, gain is 6.586. In water, the return loss is -12.298 dB, VSWR is 1.641 dB and the gain is -38.04 dBi. From this study, the value of epsilon affects the working frequency of the antenna. A small epsilon value affects the size of the gain value. In the bandwidth parameter, the greater the value of epsilon, the wider the bandwidth produced.

Keywords: Epsilon, FR-4 Epoxy, Microstrip Antenna, Nitrogen, Substrate, Water.