

Implementation model of rectangular microstrip antenna with multilayer air gap

ABSTRACT

Improvements on microstrip antenna have gain attention from many researchers. There are several methods used to enhance the performance of the antenna. This paper presents the implementation on one of the methods, applying air gap on multilayer antenna. This method improves the gain, efficiency and bandwidth. Equivalent substrate relative permittivity, ϵ_{eq} of antenna with air gap is evaluated. Equivalent substrate relative permittivity is a combination of relative permittivity of each substrate layers. The rectangular microstrip antenna is fed by coaxial method at resonating frequency of 5.00 GHz. The equivalent relative permittivity for air gap method has been observed for two models. With the proposed concept, an antenna was fabricated and tested and compared with conventional single layer antenna. Where, the bandwidth of multilayered air gap has increased significantly, the efficiency is close to 1, and the gain also increase.

Keyword: Rectangular microstrip antenna; Equivalent relative permittivity; Dielectric constant; Gain; Efficiency; Coaxial fed