UNIVERSITI TEKNOLOGI MARA

DESIGN OF A RECTANGULAR MICROSTRIP PATCH ANTENNA AT 2.4 GHZ WITH DEFECTED GROUND STRUCTURE (DGS) EFFECTS

ASLINDA BINTI ZAMAH SHARI

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ABSTRACT

DGS is a technique where the ground plane of a microstrip antenna is purposely customised by adding any shape of slot to enhance the performance of an antenna. One of the advantages adding a DGS slot shaped on the ground plane of the antenna is for antenna reduction size. Since the radio frequency (RF) devices are getting smaller and smaller in this era technology, an antenna with DGS is designed in order to meet the tininess requirements of RF devices. This paper presents the study on the effects of Defected Ground Structure (DGS) on rectangular microstrip patch antenna. The antenna was designed using substrate type of FR-4 with dielectric constant of 4.7, thickness of 1.6 mm, and tangent loss of 0.019. The antenna with and without DGS was analysed to compare the antenna performance between measurement and simulation results. The proposed antenna for Wireless Local Area Network (WLAN) application was analysed and simulated at 2.4 GHz The antenna designed with DGS was 60% more compact than the antenna without DGS. The Computer Simulation Technology (CST) software was used during the simulation result. It was found that by using the DGS method, the size of antenna was reduced.

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