

DESIGN OF RECTANGULAR PATCH ANTENNA AT 2.5GHZ  
WITH DEFECTED GROUND STRUCTURE (DGS) FOR RFID  
APPLICATION

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The purpose of this project is to develop our skill in order to solve multiple problems in much simpler ways. This is the first step to be an engineer in the future where all the skills will be tested in research, design and build the project.

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## ABSTRACT

Radio frequency Identification (RFID) is one of wireless communication technology that uses the electromagnetic in radio frequency portion of electromagnetic spectrum to uniquely identify an object or person. RFID is flexible technology that is convenient, rapidly developing and growing in many services industries. This project presents a design of rectangular patch microstrip antenna at 2.5GHz incorporated by implemented defected ground structure (DGS) features for RFID application. The rectangular patch on the top of the substrate FR-4 with the combination of DGS was designed to design, simulate, fabricate and measured the patch antenna with DGS feature and to compare the performances between conventional patch antennas with DGS patch antenna which applied the DGS on the ground plane in order to reduce size of antenna. Simulations were carried out to verify the performance of the rectangular patch antenna by using the Computer Simulation Technology (CST) Microwave Studio. Then these design structures were measure to validate the results by using the Vector Network Analyzer (VNA). Both of the result in simulation and measurement was compared. As the result of combining the rectangular patch antenna with DGS will get the size of the antenna reduced by 12.7% compared to the antenna without DGS. The return loss also was improved by 49.7%.

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