

State of Libya

Ministry of Education

Al-Asmarya Islamic University / Faculty of Engineering

**DESIGN AND SIMULATION OF 2.4 GHZ WI-FI PATCH ANTENNA USING  
CST-MICROWAVE**

A graduation project submitted in partial fulfillment of the requirements of Al-Asmarya Islamic University for the Degree of Bachelor of Science in Electrical and Computer Engineering-Communication Engineering

**BY**

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**ABSTRACT**

This project aims to design a rectangular microstrip patch antenna using Flame Retardant 4 (FR-4) with a dielectric constant of 4.3 and Roger RT/duroid 5880 with a dielectric constant of 2.2 as dielectric substrate materials and feed them using microstrip line feed and coaxial probe feed to operates at a resonant frequency of 2.4 GHz for Wi-Fi applications. The transmission line model was used in the project because it is the simplest method to get the approximate dimensions for the antennas. In this project, the Computer Simulations Technology software was used to simulate the antennas.

After the simulating was processed, the antenna parameters results (Return loss, Voltage Standing Wave Ratio, Bandwidth, Efficiency, Directivity, Gain, Half Power Beamwidth) for FR-4 and Roger RT/duroid 5880 were compared. The antenna parameters results show that the FR-4 has a higher bandwidth as compared to a Roger RT/duroid 5880; however, the efficiency, directivity, gain and half power beamwidth were enhanced with Roger RT/duroid 5880. All the antennas were designed and simulated to get minimum return loss and minimum voltage standing wave ratio.