

**INVESTIGATION ON INTEGRATED ARCHIMEDEAN SPIRAL
PATCH ANTENNA WITH LED OPERATING AT 2.4GHZ FOR
WLAN APPLICATION**

**This thesis is presented in partial fulfilment for the award of the Bachelor of
Engineering Electronic (Communication) with honours.**

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ABSTRACT

This work proposed the design of Archimedean Spiral Patch Antenna integrated with Surface Mount Device (SMD) Light Emitting Diode (LED) operating at 2.4GHz for Wireless Local Area Network (WLAN) application. The antenna was designed and simulated using Computer Simulation Technology (CST) software. Firstly, the antenna design was simulate without the LED. After the results obtained met the requirements, the LEDs were added onto the radiating patch in the simulation. Upon achieving an optimum performance, the antenna was implemented on a FR-4 material with thickness of 1.6mm and dielectric constant of 4.3. The LED was integrated with the radiating patch in parallel connection in order to have lower voltage. This design of antenna was proposed due to replace the plasma antenna which has several disadvantages and the LED was the suitable lighting source that could replace the plasma antenna. Experimental investigation was done using Vector Network Analyzer (VNA) to verify the return loss, VSWR, gain and radiation pattern of the designed antenna. Both the simulation and experimental results were then compared and analysed. The results had been confirmed that the design of the patch antenna can operate at 2.4GHz and it works well as an illumination. The antennas are reasonably well matched at their corresponding frequency of operations.

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