

ABSTRACT

This Final Project conducts research studies on Visible Light Communication technology. This study analyzes LED performance with homogeneous power for the Visible Light Communication system in the room. VLC uses LEDs as its communication medium, so that it can be implemented in closed spaces such as offices or restaurants that use LEDs as a source of lighting. Therefore a good arrangement of LEDs is needed to produce a good VLC system.

To produce good communication in indoor VLC system, this Final Project conduct an LED multipower performance analysis with 3 W, 5 W, and 7 W power, and to use 9 and 6 LEDs to produce a Bit Error Rate (BER) optimal coverage, this analysis is carried out in a closed communication room with dimensions of 10 mx 10 mx 3 m. In the VLC design simulation, it uses Pulse Position Modulation (PPM) as its modulation technique as well as the Line of sight (LOS) channel. The system performance is evaluated using several parameters including BER, Signal-to-noise ratio (SNR), and Optical Power Distribution.

The final result shows that the use of 9 LEDs with 7 W power has the best performance, with a maximum value of BER $8 \cdot 10^{-177}$ with SNR 45.69 dB.

Keywords : VLC, PPM, SNR, BER