

ABSTRACT

The development of communication technology is increasing rapidly over time. At present, radio frequency technology is still the main choice as information carriers. Visible Light Communication (VLC) technology is being developed to satisfy the needs of today's society, there are light and internet connectivity. VLC technology can be a very appropriate alternative because it has higher speed and higher security than Wireless Fidelity (Wi-Fi).

In this Final Project, simulation and analysis are done by comparing the performance of Quadrature Phase Shift Keying (QPSK), 8-Phase Shift Keying (8-PSK), and 16-Phase Shift Keying (16-PSK) mappers on DC Biased Optical Orthogonal Frequency Division Multiplexing (DCO-OFDM) modulation in VLC. System performance is evaluated using SNR parameters and reference Bit Error Rate (BER) $\leq 10^{-3}$.

After simulations and analysis on this Final Project are done, it can be concluded that the QPSK mapper is the most effective for use in DCO-OFDM modulation on VLC system because it can reach wide communication with BER $\leq 10^{-3}$ of 24.84 m² whereas 8-PSK able to reach 22.6 m² and 16-PSK only reach 14.92 m², which simply uses 1 LED with 5 Watt power in an indoor room. QPSK Mapper on DCO-OFDM is also able to reach BER threshold with the lowest SNR compared to 8-PSK and 16-PSK mapper, with SNR consecutive values are 18 dB, 23 dB, and 28 dB.

Keywords: VLC, BER, QPSK, 8-PSK, 16-PSK, DCO-OFDM.