

ABSTRACT

The need for faster access to information is one of the challenges in the development of telecommunications technology. Radio Frequency (RF) is one of the most widely used wireless technologies, but this technology has several disadvantages, the fewer available frequencies, limited speed and can still be hacked. VLC technology utilizes light as a carrier signal to carry information so that it has a high level of security, much faster speeds and free spectrum licenses.

In this final project, Wavelength Division Multiplexing (WDM) is used in the UVLC circuit. Using OOK-RZ and OOK-NRZ modulation, several scenarios were carried out in order to analyze whether the use of WDM could help improve data transmission. Focusing on analyzing BER and Q-Factor values using WDM UVLC circuit with OOK-RZ and OOK-NRZ modulation. Tests are carried out at various distances from 250 meters, 500 meters, 750 meters to 1000 meters. The power is also varies from 2 Watt, 4 Watt, 6 Watt, 8 Watt and 10 Watt.

Based on the results of the research, a percentage can be made for the comparison of BER and Q-Factor in the OOK-RZ series without WDM and OOKRZ with WDM. The percentage increase in BER is 0.025% on a LASER with a wavelength of 514 nm in the OOK-RZ circuit with WDM. The circuit using WDM resulted in a 100% Q-Factor increase in the LASER with a wavelength of 488 as the first source, and a 57% increase in the second source. Meanwhile, at 514 nm, the Q-Factor decreased by 3% for all LASERs. For the comparison of BER and QFactor in the OOK-NRZ and OOK-NRZ circuits using WDM, it shows that the BER value does not increase or decrease. In the Q-Factor results, the use of WDM resulted in a decrease of 210%.

Keywords : *UVLC, OOK-NRZ, OOK-RZ, SNR, BER, Q-Factor, Wavelength Division Multiplexing.*