

Abstract

In this digitalization era, the community's need for super-fast service is a top priority to be able to compete in the world market. These services are the ability to communicate long and near. Producing skyscrapers in big cities makes radio frequency communication ineffective to use. NG-PON2 is the development of PON optical technology standardized by ITU-T in 2015. This technology can transfer data up to 40Gbps. This broadband technology is very suitable to serve the needs of high quality voice, video and data services. One important thing that must be considered in realizing this service is choosing the right modulation technique or line code and minimizing the number of Bit Errors that might occur in the sending process.

This study will make several research scenarios where Scenario 1 is made to determine the NG-PON2 network system that will analyze its performance, the scenario uses a total bitrate of 40Gbps using OLT 4 lambda, then two scenarios are created from this network with different types of line codes to the Bit Error Rate performance.

This research produces NRZ line code that works optimally to be used for NG-PON2 with a maximum transmit distance of 60 km with BER value $\leq 10^{-9}$ corresponding to the standards set by ITU-T. While the RZ only works optimally at 20km.

Keywords: NG-PON2, ITU-T, Line Code, NRZ, RZ, BER, OLT, PON.