

ABSTRACT

In the development of information technology and communication today, FTTH network will be a communication network that is more reliable to use today, where people today need faster data transmission and wider bandwidth for communication access. A Gigabit Passive Optical Network (GPON) technology is able to achieve a highly reliable due to the high bitrates of up to 2,5 Gbps for downstream and 1,25 Gbps downstream for upstream. GPON is not the only factor affecting performance FTTH network, another factor that affect the performance is the location of the modulation on the transmitter side of the network.

Modulation is the process of converting the signals into specific shapes in order to be transmitted to the destination. Based on layout of the modulation, light in optical fibers can be modulated directly and externally. In the direct modulation light will be modulated in the light source device, while the external modulation of light to be modulated beyond the light sources. This research analyzes the feasibility of network parameters such as link power budget, rise time budget. And Signal to Noise Ratio (SNR), Bit Error Rate (BER), and eye diagrams obtained from the simulation results with Optisystem software.

This research simulate the network based on map of Batunggal Residence at ODC FBG and one distribution from FBG 43 to FBG 54. The network uses a transmitter with direct and external modulation according to the specifications from the datasheet. At the end of the research obtained the output power of direct modulation is 2,388 dBm greater than the external modulation is 0.934 dBm. And on the power link budget analysis at the direct and external modulation at the nearest and farthest distances obtained receiver power greater than detector sensitivity by -28 dBm. For the rise time budget analysis on both modulation also meet eligibility because it is below the maximum limit t_{total} of NRZ is 0.28 ns. SNR obtained in both modulation also remained above the threshold SNR at 21.5 dBm. And BER are obtained on the external modulation is much better than direct modulation modulation but both is still feasible because BER is still below the maximum limit BER of 10^{-9} .

Keywords : GPON, FTTH, direct modulation, external modulation