

## ABSTRACT

The internet access network has now switched to optical fiber. The transition from the copper access network to the fiber optic access network is due to better service and efficiency in the distribution of optical link development to homes, which we are familiar with Fiber To The Home (FTTH) that uses Gigabyte Passive Optical Network (GPON) technology . In this Final Project Grand Sharon Residential was chosen as the research location

The methods used in this study include: location survey, track and device design, and research results with analysis of power link budget, rise time budget, and bit error rate. This analysis also uses simulations using Optisystem7 to compare results with manual calculation analysis

The results of the calculation power link budget from central to the farthest distance to the customer, are obtained results on the ODC-CJA-FBT downstream path is -17.81698 dBm and for the ODC-CJA-FBG downstream line of -17.6366 dBm. Then the ODC-CJA-FBT upstream line is equal to -19,832215 dBm and for the upstream ODC-CJA-FBG line is -19,51655. Where the results of all these calculations are still below the receiver sensitivity -28 dBm. For BER, the FBT and FBG paths are smaller than the BER standard which is  $10^{-9}$  and the Q-Factor obtained is greater than the optical communication standard, which is 6.

**Keywords** : BER FTTH, GPON, Grand Sharon Residential, Link budget.