

ABSTRACT

Private Housing Cluster Plemburan Yogyakarta is a house that is currently under construction, FTTH network is not yet available, and this housing concept requires triple play quick access services to support the activities of its residents. The author plans to design the construction of a Fiber To The Home (FTTH) network with the provisions of using XG-PON technology.

This study calculates the feasibility of the network and the performance of the FTTH network design to be applied in the construction of the Private Housing Cluster Plemburan Yogyakarta. The parameters used to test the feasibility are the calculation of the Link Power Budget and Rise Time Budget. In this final project, we compare the calculated values manually and the simulation results.

The calculation of the downstream Link Power Budget attenuation manually produces the nearest downstream value of 23,2443 dB and Prx of -23,2443 dBm. The farthest downstream with a value of 23,2751 dB and Prx of -23,2751 dBm. The calculation of the upstream Link Power Budget attenuation manually produces the closest upstream value of 23,649 dB and Prx of -24,649 dBm. The farthest upstream is 23,693 dB and Prx is -24,693 dBm. For the RTB value, the time limit value is 0.07 ns for NRZ encoding, 0.035 ns for RZ encoding for downstream links, while for upstream links the time limit value is 0.28 ns for NRZ encoding, and 0.14 ns for RZ encoding. The farthest downstream link is 0.06803691 ns, the farthest upstream link is 0.062775 ns. RTB results produce values that meet the standards of the time constraint of each encoding. The overall calculation results have met the ITU-T G.987.2 standard with the provisions of the LPB results with a total attenuation limit of 28 dB, Prx with a minimum receiving power limit of -28 dB for downstream and -27.5 for upstream, SNR 22, Q value -Factor 6 and BER value $\leq 10^{-9}$.

Keywords: FTTH, XG-PON, LPB, RTB, SNR, Q-Factor, BER.