

ABSTRACT

The train is one of the most popular public transportation than other transportation. because the costs are relatively cheap, convenient and timely. Therefore, Indonesia will build fast train transportation facility on the Jakarta - Surabaya route with a speed of 140 km/hour at a frequency of 900 MHz.

Optical backbone technology can be used in Synchronous Digital Hierarchy (SDH) STM-64 Dense Wavelength Division Multiplexing (DWDM), access network technology using XG-PON and LTE (Long Term Evolution) core network technology using EPC. The design is made with parameters delay, power link budget, Q-factor, rise-time, SNR, AND BER with standard provisions of ITU-T G.987, ITU-T G696.1 AND 3GPP TS23,203.

Delay parameter on the farthest downstream link which is 2.12274208 ms, while on upstream side is 2.12271064 ms. The lowest parameter of LPB on downstream side is -24,421 dBm, Q-factor 5.8221, BER 2.99×10^{-9} , and RTB 0.046097796 ns. The lowest parameter value on LPB upstream access link is -24,896 dBm, Q-factor 5.669152517, BER 7.39×10^{-9} and RTB 0.046097843 ns. On the backbone side, the lowest value is LPB -26.09, Q-factor 6.425875721, BER 6.71×10^{-11} , and RTB 0.046098000 ns.

Keywords: Backhaul, LTE (Long Term Evolution), XGPON(10-Gigabit Passive Optical Network), STM-64