ABSTRACT

The Central Statistics Agency (BPS) estimates that the use trains for long trips is the main choice for the community because the costs relatively cheap, convenient and timely. Therefore, Indonesia will build fast train transportation facility on the Jakarta - Surabaya route with aspeed of 140 km/hour at a frequency of 900 MHz.

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

The delay parameter on the downstream link, which is 0.301542723 ms, while on upstream side it is 0.391485044 ms. The lowest parameter Link Power Budget is -25.856 dBm, Q-facto 5.86391646, BER 1.05 x 10-09 and RTB0.046097811 ns downstream access links. While lowest parameters the upstream access link LPB -27.32 dBm, Q-factor 5.919171048, BER 1.66 x 10-09, and RTB 0.046097867 ns. On the backbone link the lowest parameter value for LPB is -24,812 dBm, Q-factor 7.499397163, BER 1.33 x 10-14 and RTB 0.046098076 ns

Keywords: Backhaul, XG-PON, LTE (Long Term Evolution), STM-64, Backbone