The Performance Limitation of 10-Gbps-per-Channel-based Coarse Wavelength Division Multiplexed Passive Optical Network

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***Abstract*—In this paper, we study the performance limitation of the 10-Gbps-per-channel-based coarse wavelength division multiplexed passive optical network (CWDM-PON). The computer simulation results, which are in a good agreement with the theoretical calculation results, show that the transmission of all 16 CWDM channels (1,271-1,571 nm) is successfully obtained at the maximum reach of 68.2 km under FEC limit (BER= 10^{-4}). Both fiber attenuation and fiber dispersion are the main factors that limit the achievable reaches for different channel wavelengths. The power budget, which is useful for the design of the 16×10-Gbps-based CWDM-PON, is found to be 38.65 dB.**

***Keyword*—fiber access network, passive optical network, coarse wavelength division multiplexing, fiber attenuation, fiber dispersion.**

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