

Abstract

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Performance Evaluation and Optimization of Wavelength Division Multiplexing Passive Optical Networks: The Promising Solution for the Next Generation of the Fiber To The Home

In this paper, a central power source architecture is applied to a realize power saving wavelength division multiplexing passive optical network (WDM-PON). Parametric study is evaluated to extend the transmission distance up to 60 and 80 km. Optical launched power is optimized through the parametric study. A full duplex 16 optical channels WDM-PON system are experimentally simulated and analyzed. Successful transmission achieved maximum bit error rate (BER) of 10^{-13} . A return-to-zero differential phase shift keying (RZ-DPSK) modulation technique is utilized for downlink direction, and then the downlink signal is re-modulated for the uplink direction using intensity modulation technique of on-off keying (OOK) with a data rates of 5 and 1 Gbit/s per channel.