Abstracts

Gigabit/s Optical Receiver Sensitivity and Zero-Dispersion Single-Mode Fiber Transmission at 1.55 µm

J.-I. Yamada, A. Kawana, T. Miya, H. Nagai and T. Kimura. "Gigabit/s Optical Receiver Sensitivity and Zero-Dispersion Single-Mode Fiber Transmission at 1.55 µm." 1982 Transactions on Microwave Theory and Techniques 30.10 (Oct. 1982 [T-MTT] (Special Issue on Optical Guided Wave Technology)): 1525-1535.

High-speed pulse response and receiver sensitivity at 1.55 µm were measured at data rates ranging from 400 Mbits/s to 2 Gbits/s, in order to elucidate characteristics of a reach-through p/sup +/nn/sup -/ Ge APD. The p/sup +/nn/sup -/ Ge APD receiver provided a 2 Gbit/s received optical power level of -32.0 dBm at 1.55 µm and a 10/sup -9/ error rate, which was 4 dB better than the receiving level with a p/sup +/n Ge APD. Detector performance at 1.3 µm was also studied for comparison with performance at 1.55 µm. Single-mode fibers, which have 0.54 dB/km loss and zero dispersion at 1.55 µm, and an optical transmitter-receiver, whose repeater gain is 29.2 dB, have enabled 51.5 km fiber transmission at 2 Gbits/s. The transmission system used in this study has a data rate repeater-spacing product of 103 (Gbits/s) /spl dot/ km at 1.55 µm. Optical pulse broadening and fiber dispersion were also studied, using 1.55 and 1.3 µm dispersion free fibers. Future repeater spacing prospects for PCM-IM single-mode fiber transmission systems are discussed based on these experimental results.

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