Abstracts

Characteristics of Gbit/s Optical Receiver Sensitivity and Long-Span Single-Mode Fiber Transmission at 1.3 µm

J.-I. Yamada and T. Kimura. "Characteristics of Gbit/s Optical Receiver Sensitivity and Long-Span Single-Mode Fiber Transmission at 1.3 µm." 1982 Transactions on Microwave Theory and Techniques 30.4 (Apr. 1982 [T-MTT] (Joint Special Issue on Optical Guided Wave Technology)): 564-573.

Sensitivity of a 1.3 µm Ge APD receiver was measured at data rates ranging from 100 Mbits/s to 2 Gbits/s, using a high-speed GaAs FET RZ driver, low-noise Si bipolar transistor (BIT) receiver amplifier, a highly sensitive TD comparator. The required received optical level at a 10/sup -9/ error rate was -31.9 dBm for 2 Gbits/s with a Ge APD/Si BIT front end having a 50 Omega input impedance. A Ge APD/ GaAs FET front end, with a 500 Omega input impedance, brought about 2 dB improvement at 100 Mbits/s, as compared with a Ge APD/Si BIT (50 Omega) front end. A coupling loss of 4 dB, achieved by a hemispherical microlens tipped on a single-mode fiber, and a low fiber loss of 0.57 dB/km, including splice loss, enabled 44.3 km single-mode fiber transmission at 2 Gbits/s. The 1.3 µm transmission system has a data rate repeater-spacing product of 88.6 (Gbit/s)km. Prospects of Gbit/s receiver sensitivity, the 2 Gbit/s transmission system, with more than 50 km repeater spacing, are also discussed.

❑ Return to main document.