Abstracts

Optical Feedback on Linearity Performance of 1.3 µm DFB and Multimode Lasers Under Deep Microwave Modulation

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High-speed InGaAsP laser diodes (LDs) are expected to be extensively used in microwave analog fiber optic systems because of the low dispersion and attenuation in the 1.3 µm wavelength region. In this paper, we examine the effect of optical feedback on the linearity performance of both a 1.3 µm single-longitudinal-mode (SLM) distributed feedback double-channel planar buried heterostructure (DFB-DC-PBH) LD and a 1.3 µm multi-longitudinal-mode (MLM) buried heterostructure "window" LD. Both lasers are intrinsically highly linear in the absence of optical feedback. The effect of optical feedback is examined by a quantitatively controlled reflection at the end of a 1~2 meter pigtail. Particular attention is paid to cases where both lasers are intensity modulated by large signals (current modulation index 50% to 80%) with frequencies above 1 GHz. Modulation signal power level, frequency, and laser bias level that affect the light coherent property, and hence laser linearity characteristics under optical feedback, are discussed.

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