Abstracts

Improved intrinsic dynamic distortions in directly modulated semiconductor lasers by optical injection locking

Xue Jun Meng, Tai Chau and M.C. Wu. "Improved intrinsic dynamic distortions in directly modulated semiconductor lasers by optical injection locking." 1999 Transactions on Microwave Theory and Techniques 47.7 (Jul. 1999, Part II [T-MTT] (Special Issue on Microwave and Millimeter-Wave Photonics)): 1172-1176.

The effects of optical injection locking on the nonlinear distortions of directly modulated semiconductor distributed feedback (DFB) lasers are investigated experimentally. The second harmonic distortion (SHD) and third harmonic distortion (THD), as well as the third-order intermodulation distortion (IMD3), are measured as functions of modulation frequency for both the free-running and injection-locked lasers. Under strong injection locking with -8-dB injection ratio, the SHD and THD of the DFB laser have been suppressed by 15 dB from 2 to 4 GHz. Moreover, nearly 15-dB reduction in IMD3 has been observed from 1.4 to 3.0 GHz with the same injection conditions. We also found that the injection locking is not effective in reducing the low-frequency distortions.

❑ Return to main document.