Abstracts

Ultrahigh Speed Cryogenic Laser Diodes for Broadband Optical Fiber Link Applications

R.-C. Yu, R. Nagarajan, T. Reynolds, J.E. Bowers, M. Shakouri, J. Park, K.Y. Lau, C.-E. Zah, W. Zou and J. Merz. "Ultrahigh Speed Cryogenic Laser Diodes for Broadband Optical Fiber Link Applications." 1995 MTT-S International Microwave Symposium Digest 95.1 (1995 Vol. I [MWSYM]): 45-48.

In this paper, we present the first systematic study of the temperature dependence of the high speed performance of various laser diodes from room temperature down to 10K. We found that as the threshold current of these diodes decreases by at least an order of magnitude at low temperatures, the modulation bandwidth is dramatically improved. The best result is 27 GHz at 100K for an InGaAsP multiple quantum well laser. We also present experiments on a broadband optical fiber link utilizing a cooled laser diode as a transmitter for 10 Gb/s digital data transmission and 28 GHz carrier video delivery applications.

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