Abstracts

Interfaces for High-Speed Fiber-Optic Links: Analysis and Experiment

A.S. Daryoush, E. Ackerman, N.R. Samant, S. Wanuga and D. Kasemset. "Interfaces for High-Speed Fiber-Optic Links: Analysis and Experiment." 1991 Transactions on Microwave Theory and Techniques 39.12 (Dec. 1991 [T-MTT] (1991 Symposium Issue)): 2031-2044.

An analysis of directly and externally modulated fiberoptic links is presented here. The theoretical analysis is based on the signal flow diagram of the interface circuits to the laser diode, Mach-Zehnder electro-optic modulator, and p-i-n photodiode. System parameters such as gain, noise figure, two-tone intermodulation distortion, and spurious free and compression dynamic range are expressed as a function of frequency and operating point of the laser and external modulator. Two directly and externally modulated fiber-optic links were designed and fabricated to verify the analytical models. The direct modulation FO link was developed at the Ku-band (11.6-12.4 GHz), whereas the external modulation link was at L-band (875-925 MHz). Spurious-free dynamic ranges of 95.8 dB·Hz/sup 2/3/ and 113 dB·Hz/sup 2/3/, respectively, were achieved, the best reported to date for these frequency bands. The predictions based on the analytical models match the measured results very well.

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