Abstracts

Maximum Dynamic Range Operation of a Microwave External Modulation Fiber-Optic Link

E. Ackerman, S. Wanuga, D. Kasemset, A.S. Daryoush and N.R. Samant. "Maximum Dynamic Range Operation of a Microwave External Modulation Fiber-Optic Link." 1993 Transactions on Microwave Theory and Techniques 41.7 (Aug. 1993 [T-MTT]): 1299-1306.

We fully analyze the analog performance of an external modulation fiber-optic link. We express relevant figures of merit including gain, noise figure, third-order intermodulation distortion, AM compression, and dynamic range in terms of the microwave scattering matrices of the modulator and detector circuits, and we predict the modulator bias condition promoting optimum link performance. Our predictions match the measured gain, noise figure, and dynamic range of an experimental 870-930 MHz external modulation fiber-optic link. Maximum spurious-free dynamic range--77 dB. MHz/sup 2/3/ (117 db·Hz/sup 2/3/)--occurs when the modulator is biased at its halfwaye voltage, where the optical throughput is nearly pinched off.

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