Abstracts

Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers

H. Kikuchi, Y. Miyagawa and T. Kimura. "Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1916-1923.

This paper discusses the development of IC's for a preamplifier, a gain-controllable amplifier, and main amplifiers with and without a three-way divider for multigigabit-per-second optical receivers using a single-ended parallel feedback circuit, two (inductor and capacitor) peaking techniques, and advanced GaAs process technology. An optical front-end circuit consisting of a GaAs preamplifier and an InGaAs p-i-n photodiode achieves a 3 dB bandwidth of 7 GHz and -12 dBm sensitivity at 10 Gb/s. Moreover, a gain-controllable amplifier obtains a maximum gain of 15 dB, a gain dynamic range of 25 dB, and a 3 dB bandwidth of 6.1 GHz by controlling the source bias of the common-source circuit. Gain, 3 dB bandwidth, and output power of the main amplifier with the three-way divider are 17.4 dB, 5.2 GHz, and 5 dBm, respectively. These IC's can be applied to optical receivers transmitting NHZ signals in excess of 7 Gb/s.

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