Abstracts

An AlGaAs/InGaAs Pseudomorphic HEMT Modulator Driver IC with Low Power Dissipation for 10 Gb/s Optical Transmission Systems

M. Miyashita, M. Shimada, N. Yoshida, Y. Kojima, T. Kitano, N. Higashisaka, J. Nakagawa, T. Takagi and M. Otsubo. "An AlGaAs/lnGaAs Pseudomorphic HEMT Modulator Driver IC with Low Power Dissipation for 10 Gb/s Optical Transmission Systems." 1996 MTT-S International Microwave Symposium Digest 96.3 (1996 Vol. III [MWSYM]): 1433-1436.

An optical modulator driver IC has been developed for 10 Gb/s optical communication systems. In order to realize both high frequency operation and low power dissipation, 0.2-µm T-shaped gate AlGaAs/InGaAs pseudomorphic HEMTs, which give large transconductance, g/sub m/, of 610 mS/mm and high cut-off frequency, f/sub T/, of 67.5 GHz, have been employed. In addition, by using a current mirror circuit with cascode configuration as high impedance current source, power dissipation of 1.1 W is achieved at a 10 Gb/s NRZ signal output with 3 V/sub p-p/. This dissipation is the lowest value ever reported. As an additional function, the output voltage swing can be controlled from 2 to 3.3 V /sub p-p/ by the current mirror circuit in order to adjust the duty factor of optical output signal through an optical modulator.

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