Abstracts

Nonlinear Circuit Analysis of Laser Diodes Under Microwave Direct Modulation

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A microwave nonlinear circuit analysis technique which can account for all known steady-state responses has been developed and applied to the large-signal characterisation of directly modulated laser diodes. An equivalent circuit derived from the rate equations is used to model the laser diode. The proposed technique is based on a harmonic balance algorithm which represents two-tone inputs by describing frequencies. Second harmonic and third-order intermodulation distortion results for a GaAlAs diode have been compared with corresponding measured data to validate the approach taken. Aperiodic responses are detected by means of bifurcation theory.

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