Abstracts

A Large Signal Equivalent Circuit Model for Multielectrode Laser and Microwave Semiconductor Lasers for CAD Applications

H. Elkadi, S. Maricot, R. Hamelin, J. Harari, J.P. Vilcot and D. Decoster. "A Large Signal Equivalent Circuit Model for Multielectrode Laser and Microwave Semiconductor Lasers for CAD Applications." 1993 MTT-S International Microwave Symposium Digest 93.1 (1993 Vol. I [MWSYM]): 217-220.

We present an equivalent circuit large signal model of semiconductor lasers for microwave applications. The model is implemented on SPICE software and is based on a modified set of the monomode rate equations. The carriers density in the active region is related to the potential at the terminals of the active region by a polynomial approximation of the Fermi Integral. Different recombination mechanisms (Schockley-Hall-Read, spontaneous and Auger) are represented by separate terms and not as a global constant life time. The model also accounts for saturable aborption occuring in the case of multielectrode lasers. Different applications are presented. A study of the behaviour of a multielectrode laser with saturable absorbers, under static, transient and small signal conditions is performed. The study shows the bistability of this type of lasers and predicts an extremely wide band up to the millimetric frequencies range. Another application of the model is the matching of the impedance of the laser to the 50Omega of the microwave source; using passif reactive circuit.

❑ Return to main document.