Abstracts

Simulation and Design of Microwave Class-C Amplifiers through Harmonic Analysis (Dec. 1979 [T-MTT])

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A method for analyzing microwave class-C amplifiers is proposed which satisfies the requirements of a wide application field, and, at the same time, operates with a fast runing time and without convergence problems. It is based on the partitioning of the circuit into linear and nonlinear subnetworks for which, respectively, frequency-domain and time-domain equations are written. Then, taking into account that the time-domain and frequency-domain representations are related by the Fourier series, the circuit behavior is described by means of a system of nonlinear equations whose unknowns are the harmonic components of the incident waves at all the connections. To overcome the numerical problems arising in the search for the solution of this system when strong nonlinearities are involved, a special step-by-step procedure is adopted. The problem is transformed into the search for the solution of a sequence of well-conditioned systems of equations corresponding to a sequence of well-chosen circuits obtained from the original one through progressive changes of the input signal starting from 0 up to the nominal value. The program which implements the method is also described and the results of the analysis relative to a class-C amplifier are compared with measured values.

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