Abstracts

Large-signal circuit-based time domain analysis of high frequency devices including distributed effects

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A fully distributed equivalent circuit model for MESFET is presented in this paper. The distributed circuit model incorporates sufficient number of segments to account for accurately wave propagation effects along device width. For the first time, distributed model having several segments is analyzed in time domain, which has the capability to evaluate large signal behavior. For a given MESFET, passive equivalent circuit elements are extracted from full wave simulation of the passive part as coplanar-coupled transmission lines using finite difference time domain technique. Active equivalent circuit elements are obtained from full hydrodynamic simulation with Curtice large signal model. The two equivalent circuits are combined together to form the basic unit segment. Several high frequency and high power characteristics of transistors are investigated and compared with previously published results.

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