Abstracts

Semidistributed Model of Millimeter-Wave FET for S-Parameter and Noise Figure Predictions

L. Escotte and J.-C. Mollier. "Semidistributed Model of Millimeter-Wave FET for S-Parameter and Noise Figure Predictions." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 748-753.

Besides sophisticated fully distributed FET models for predicting small-signal performance up to millimeter-wave frequencies, it may be convenient to make use of a simpler electrical model which avoids the need of solving coupled differential equations while taking account of propagation effects along device electrodes. We present a new electrical FET model derived from a partition of the actual transistor along its gate width into N identical sections. This so-called sliced model has two main advantages in comparison with distributed models: first, the derivation of its element values is obtained by a direct application of Kirchhoff's laws and, second, insertion of the noise sources is easy and makes it possible to predict the FET noise parameters. An example is given that shows good agreement between minimum noise figures derived from the "sliced" model and from the Fukui formula in the range 18--40 GHz.

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