Abstracts

A new approach to FET model scaling and MMIC design based on electromagnetic analysis

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A new approach, using electromagnetic analysis, is proposed for field-effect transistor model scaling and monolithic-microwave integrated-circuit (MMIC) design. It is based on an empirical distributed modeling technique where the active device is described in terms of an external passive structure connected to a suitable number of internal active sections. On this basis, an equivalent admittance matrix per gate unit width is obtained which, as confirmed by experimental results provided in this paper, is consistent with simple scaling rules. The same technique can also be adopted for a "global approach" to MMIC design where complex electromagnetic phenomena are also taken into account. An example of application concerning this aspect is presented.

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