Abstracts

A new extrinsic equivalent circuit of HEMT's including noise for millimeter-wave circuit design

G. Dambrine, J.-M. Belquin, F. Danneville and A. Cappy. "A new extrinsic equivalent circuit of HEMT's including noise for millimeter-wave circuit design." 1998 Transactions on Microwave Theory and Techniques 46.9 (Sep. 1998 [T-MTT]): 1231-1236.

In this paper, we propose a reliable extrinsic equivalent circuit of a high-performance high electron-mobility transistor (HEMT) to determine both the [S]-parameters and noise parameters in the millimeter-wave range from characterizations performed below 40 GHz. In the case of the conventional equivalent circuits, only three extrinsic elements have to be determined instead of (at least) eight. We show the validity of the proposed extrinsic equivalent circuit by [S]-parameters and noise figure measurements up to the W-band (75-110 GHz). The proposed equivalent circuit is reliable and is very well suited for the design of low-noise integrated circuits for millimeter waves.

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