Abstracts

A Semidistributed HEMT Model for Accurate Fitting and Extrapolation of S-Parameters and Noise Parameters (Short Papers)

M.T. Hickson, P. Gardner and D.K. Paul. "A Semidistributed HEMT Model for Accurate Fitting and Extrapolation of S-Parameters and Noise Parameters (Short Papers)." 1992 Transactions on Microwave Theory and Techniques 40.8 (Aug. 1992 [T-MTT]): 1709-1712.

A model is described for a low noise mm-wave HEMT device. It takes account of the distributed nature of the gate and drain electrodes by dividing the active region of the device into a number of slices. Each slice is modelled as an intrinsic HEMT with thermal noise sources and the slices are connected together through lossy reactance. The parameters of the first slice are made different from those of the remaining slices, in order to account for the inevitable differences in the field distribution in the gate feed region. The model parameters have been optimized numerically to fit the manufacturer's measured S-parameters and all four noise parameters, for a commercially available HEMT chip. A good fit has been achieved simultaneously to all of these parameters, and the model therefore provides a reasonable basis for extrapolation to higher frequencies. The significance of the distributed gate effect and the unequal slice effect are assessed by comparing the best fit achievable when these effects are not included.

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