Abstracts

Analysis of Wave Propagation Effects on Microwave Field-Effect Transistors

M.S. Hakim and S.M. El-Ghazaly. "Analysis of Wave Propagation Effects on Microwave Field-Effect Transistors." 1993 MTT-S International Microwave Symposium Digest 93.3 (1993 Vol. III [MWSYM]): 1303-1306.

As the operating frequency increases, electromagnetic wave propagation effects on FET electrodes cannot be ignored. In this paper, these effects are investigated by analyzing two devices; the conventional MESFET and the INGFET, which is properly designed to exploit the wave propagation effects. The wave effects are analyzed using a CAD model which accounts for the semiconductor characteristics and the nonstationary electron dynamics, the electromagnetic characteristics and the parasitic elements of the device. The importance of including the wave propagation effects in the device analysis is strongly manifested in the results. It is shown that the amplification factor of the gainful mode of the INGFET is larger than that of the MESFET for higher frequencies and wider devices. Also, the INGFET exhibits higher gain when operated in the TWT mode and when terminated with 50-Omega loads as well.

❑ Return to main document.