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Analytical Large Signal Model

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Abstract - Literature reported that a semi-empirical graph field effect transistor (G-FET) model for analysis and design of G-FET-based circuits. The model describes the current-voltage characteristic for a G-FET over a wide range of operating conditions. The gate bias dependence of the output power spectrum is studied and compared with the simulated values. Good agreement between the simulated and the experimental power spectrums up to the third harmonic is demonstrated, which confirms the model validity. More over S-parameter measurements essentially coincide with the results obtained from the simulation. The model contains a small set of fitting parameters, which can be straight forwardly extracted from the S-parameters and dc measurements. The developed extraction method gives a more accurate estimation of the drain and source contact resistance compared with other approaches. As a design example, we use a harmonic balance load-pull approach to extract optimum embedding impedance value for a sub harmonic G-FET mixer.