Abstracts

Nonlinear Model for Predicting Intermodulation Distortion in GaAs FET RF Switch Devices

J.A. Pla and W. Struble. "Nonlinear Model for Predicting Intermodulation Distortion in GaAs FET RF Switch Devices." 1993 MTT-S International Microwave Symposium Digest 93.2 (1993 Vol. II [MWSYM]): 641-644.

A nonlinear model for predicting IMD in GaAs FET RF switch devices has been developed. A new unified equivalent circuit model of the switch FET for the ON and the OFF states has been proposed. The nonlinearities of the test FET as a function of the gate bias were identified and modeled up to 40 GHz by fitting scattering parameter data. These nonlinearities were combined into a single nonlinear model constructed from a number of elementary linear and nonlinear elements. The nonlinear circuit equations were incorporated as a user defined model in LIBRA/sup TM/ to perform the harmonic balance technique. This new model has been used to predict the IMD and phase shifting performance of three of the individual bit chips (11.25, 22.5 and 180 degrees) of a 6 to18 GHz wideband five-bit phase shifter. In this phase shifter, GaAs MESFETs are used as switch devices which configured the bits into high or low pass filter structures.

❑ Return to main document.