Abstracts

Stability Analysis and Numerical Simulation of Multidevice Amplifiers

M. Ohtomo. "Stability Analysis and Numerical Simulation of Multidevice Amplifiers." 1993 Transactions on Microwave Theory and Techniques 41.6 (Jun./Jul. 1993 [T-MTT]): 983-991.

Stability analysis of multidevice amplifiers is made on a generalized circuit comprising two n-ports with S-matrices S (active devices) and S' (passive networks) connected at n interface ports. Open-loop transfer functions defined for a signal-flow graph and its (n-1) subgraphs of incident and reflected waves at the interface ports are expressed in terms of det M/sub n/ and its minors, where M/sub n/ =S'S-I/sub n/and I/sub n/=nxn identity matrix. It is shown that the Nyquist plots of the n transfer functions completely characterize the number of right-half complex-frequency-plane zeros of det M/sub n/, and hence the amplifier stability. Insertion of an ideal circulator and isolators at the interface ports enables one to calculate the Nyquist plots and voltage distributions of possible instabilities using commercially available linear circuit simulators. Numerical simulations for two types of parallel-operated GaAs FET amplifiers are performed to verify the usefulness of the analysis to design-phase check on multidevice amplifier stability.

❑ Return to main document.