Abstracts

Simulation Diagnostics of Multiple Discontinuities in a Microwave Coaxial Transmission Line

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Multiple discontinuities in microwave transmission lines can cause unusual reflection and transmission loss characteristics as functions of frequency. This article presents a method for developing models that simulate return loss and insertion loss data measured over a broad band of frequencies. The overall cable is modeled as a coaxial transmission line consisting of shunt susceptance discontinuities separated by line lengths. A nonlinear least-squares fit is then performed between theoretical data (from the model) and experimental data. When this method was applied to modeling discontinuities in a slightly damaged S-band antenna cable, excellent agreement between theory and experiment was obtained over a frequency range of 1.70-2.85 GHz.

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