Abstracts

Admittance Matrix Formulation of Waveguide Discontinuity Problems: Computer-Aided Design of Branch Guide Directional Couplers

F. Alessandri, G. Bartolucci and R. Sorrentino. "Admittance Matrix Formulation of Waveguide Discontinuity Problems: Computer-Aided Design of Branch Guide Directional Couplers." 1988 Transactions on Microwave Theory and Techniques 36.2 (Feb. 1988 [T-MTT] (Special Issue on Computer-Aided Design)): 394-403.

A computational scheme is proposed which can be applied to the analysis of cascaded waveguide discontinuities of alternating boundary-enlargement and boundary-reduction type. Based on the mode-matching technique, the proposed procedure makes use of the admittance matrix characterization of waveguide stubs. With respect to the conventional S-matrix formulation, it leads to a notable reduction of the computational effort, particularly for lossless structures. At the same time, the criterion for avoiding relative convergence problems can be satisfied. The procedure has been used to setup a very accurate and efficient computer-aided design tool of branch guide couplers (BGC's) These are key elements of beam forming networks for multicontoured beam satellite antennas and have to be designed with very high accuracy so as to eliminate the necessity for tuning the components realized. Design accuracies better than 0.1 dB in Ku-band are demonstrated by experimental results.

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