Abstracts

New Simple Procedure for the Computation of the Multimode Admittance Matrix of Arbitrary Waveguide Junctions

A. Alvarez and M. Guglielmi. "New Simple Procedure for the Computation of the Multimode Admittance Matrix of Arbitrary Waveguide Junctions." 1995 MTT-S International Microwave Symposium Digest 95.3 (1995 Vol. III [MWSYM]): 1415-1418.

The description of the microwave properties of waveguide junctions is a subject that has been studied considerably in the past. Of particular interest, form the engineering point of view, have been equivalent network representations (single mode) because of their very good computational efficiency. However their efficiency was obtained taking into account only dominant mode interactions and such descriptions are no longer suitable for the design of modern microwave components. Higher order mode interactions have been subsequently accounted for using mode-matching procedures, however, the resulting codes, although accurate, can be computationally very heavy. It would therefore be desirable to develop equivalent network representations that could at the same time include higher-order interactions and lead to computationally efficient codes. In this paper a simple method is described for the evaluation of the multimode network representation in terms of admittance parameters. The key feature of the method is that it starts from the wanted final results, the equivalent network representation, in order to obtain an analytic expression for the evaluation of the admittance matrix elements. The procedure is based on general network theory and is equivalent to ideally measuring directly the value of the admittance elements. In this paper the evaluation procedure is fully described. Measurement results of actual hardware are then compared with simulations indicating that the codes developed are indeed very accurate as well as computationally very efficient.

❑ Return to main document.