Abstracts

Computer-Aided Design of 3-Port Waveguide Junction Circulators

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The purpose of this work is to determine the usefulness of numerical-analysis in the design of 3-port waveguide circulators. Present design techniques permit the selection of an optimum ferrite for a particular frequency range, but very little detailed prediction of performance as is usual in filter design, for example, has been attempted. This is due to the complexity of the problem and the fact that almost all of the successful empirically designed configurations are not amenable to theoretical analysis. Our efforts have been directed towards those structures which can in principle be analysed rigorously, but which do not necessarily have good performance rather than those which have good performance but can be modeled only approximately. In this paper we are interested in the feasibility of a detailed waveguide circulator theory, and we wish to clarify the effects of some important parameters. The result of this work has been computer-generated, simulated swept-frequency predictions of circulator performance which can be directly compared with laboratory measurements.

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