Abstracts

Nonreciprocity and the optimum operation of ferrite coupled lines

K. Xie and L.E. Davis. "Nonreciprocity and the optimum operation of ferrite coupled lines." 2000 Transactions on Microwave Theory and Techniques 48.4 (Apr. 2000, Part I [T-MTT]): 562-573.

The first full-wave normal-mode analysis of ferrite coupled lines (FCLs) magnetized in the longitudinal direction is presented in this paper. It is found that the tangential and axial components of the guided electric and magnetic fields undergo a different change in the process of reversing the direction of magnetization. These changes cause the same input wave to decompose into the eigenmodes of the FCL differently for different direction of magnetization and, consequently, cause the nonreciprocal behavior of the magnetized FCL. A new optimum nonreciprocal operation condition is obtained, and applications to FCL circulators built on microstrips and striplines are discussed.

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