Abstracts

A Nonreciprocal, TEM-Mode Structure for Wide-Band Gyrator and Isolator Applications

E.M.T. Jones, G.L. Matthaei and S.B. Cohn. "A Nonreciprocal, TEM-Mode Structure for Wide-Band Gyrator and Isolator Applications." 1959 Transactions on Microwave Theory and Techniques 7.4 (Oct. 1959 [T-MTT]): 453-460.

The theoretical and experimental operation of a novel form of TEM transmission-line network capable of operation over octave bandwidths is described. This network consists, basically, of a parallel arrangement of two conductors and a ferrite rod within a grounded outer shield. The conductors maybe connected in a two-port configuration which provides, in the absence of the ferrite rod, complete isolation from zero frequency to the cut-off frequency of the first higher mode. With an unmagnetized ferrite rod properly inserted, the broad-band isolation is virtually unaffected. When the rod is magnetized by an axial magnetic field, coupling occurs between the two ports by a process analogous to Faraday rotation. The device may be used as a broad-band gyrator, switch, or modulator, and with the addition of a resistance load, as an isolator. The bandwidth of these components is inherently limited only by the bandwidth capability of the ferrite material itself.

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