Abstracts

Composite-Junction Circulators Using Ferrite Disks and Dielectric Rings

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Since most junctions do not use the full available magnetic splitting of the ferrite material, it is possible to replace part of it by a dielectric. The theoretical and experimental development of such composite stripline circulators using ferrite disks surrounded by dielectric rings is given in this paper. Theoretical calculations and experimental results on the circulation frequency, gyrator admittance, and split frequencies of such circulators are included. The case of a partially magnetized ferrite disk on a ferrite substrate is treated separately. The susceptance slope parameter of this circulator geometry is also derived and measured. The results obtained in this paper show to what extent the ferrite disk behaves as a dielectric at the edge of the disk. The geometry leads to considerable saving in ferrite material, which is particularly important in UHF circulators. The experimental results are in good agreement with the theory.

❑ Return to main document.