Abstracts

Computer-Aided Design of H-Plane Waveguide Junctions with Full-Height Ferrites of Arbitrary Shape

N. Okamoto. "Computer-Aided Design of H-Plane Waveguide Junctions with Full-Height Ferrites of Arbitrary Shape." 1979 Transactions on Microwave Theory and Techniques 27.4 (Apr. 1979 [T-MTT]): 315-321.

A method for solving the problem of H-plane waveguide junctions with a full-height ferrite post of arbitrary shape is proposed. The junctions are allowed to have arbitrary cross section and arbitrary number of ports. The method is based on the integral equations derived from the reciprocity theorems in both the ferrite region and the air region ranging from the reference planes of connecting waveguides to the inside of the junction. For comparison with the previously published experimental and theoretical results, Y junctions with a circular ferrite post are first treated. Excellent agreement has been found between the experimental data and the numerical results obtained by the present method. The performance of a Y-junction circulator with a triangular ferrite post having rounded angles is next investigated. Both the ferrite geometry and the internal dc magnetic field are examined in detail. For this geometry the calculated 20-dB bandwidth has been found to become greater as the cross section of the ferrite approaches a regular triangle from a circle.

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