Abstracts

Analysis of partial-height ferrite-slab differential phase-shift sections

B.M. Dillon and A.A.P. Gibson. "Analysis of partial-height ferrite-slab differential phase-shift sections." 2000 Transactions on Microwave Theory and Techniques 48.9 (Sep. 2000 [T-MTT] (Mini-Special Issue on Research Reported at the 8th Topical Meeting on Electrical Performance of Electronic Packaging (EPEP) 1999)): 1577-1582.

Rectangular waveguide loaded with transversely magnetized ferrite slabs is a classic arrangement used in the construction of high-power differential phase-shift circulators. The characterization of this structure is extended in this paper by using a combined magnetostatic/microwave finite-element method to evaluate propagation characteristics in terms of material parameters, frequency, and bias field. Magnetic flux density was found to vary by typically 20% across a partial-height ferrite slab. Experimental phase-shift data agreed to within 5% of numerical calculations for a 9.25-GHz device. Supplementary design data are presented for the first higher order mode in the cutoff plane, the effect of material properties on phase shift, and to compare below and above resonance operation.

❑ Return to main document.