Abstracts

Theoretical Analysis of Twin-Slab Phase Shifters in Rectangular Waveguide (Jan. 1966 [T-MTT])

E. Schlomann. "Theoretical Analysis of Twin-Slab Phase Shifters in Rectangular Waveguide (Jan. 1966 [T-MTT])." 1966 Transactions on Microwave Theory and Techniques 14.1 (Jan. 1966 [T-MTT]): 15-23.

The differential phase shift and the losses to be expected in phase shifters using two oppositely magnetized ferrite slabs located symmetrically in a rectangular waveguide have been calculated for various locations and thicknesses of the ferrite slabs. For small thicknesses of the ferrite slabs, the differential phase shift increases rapidly with increasing thickness reaching a maximum when the thickness is approximately 1/10 of the free space wavelength. The calculated insertion loss of a 360-degree phase shifter decreases with increasing slab thickness for small thickness, reaching a minimum when the thickness is approximately 1/25 of the free space wavelength. The minimum insertion loss calculated with the assumption that the imaginary part of the diagonal component of the permeability tensor is 0.01 and that dielectric loss can be neglected is approximately 0.85 dB. The peak power handling capability has also been analyzed. It can conveniently be summarized in terms of a high-power figure of merit. For reasonably high values of this figure of merit, a peak power capability of the order of 100 kW is anticipated.

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