Abstracts

Quasi-Static Characteristics of Microstrip on an Anisotropic Sapphire Substrate

R.P. Owens, J.E. Aitken and T.C. Edwards. "Quasi-Static Characteristics of Microstrip on an Anisotropic Sapphire Substrate." 1976 Transactions on Microwave Theory and Techniques 24.8 (Aug. 1976 [T-MTT]): 499-505.

The well-defined and repeatable electrical properties of single-crystal sapphire make it an attractive substrate material for microstrip, but its dielectric anisotropy constitutes an important design complication. This paper describes investigations into the quasi-static characteristics of single microstrip lines on sapphire substrates cut with a specified orientation. To account for anisotropy, a new permittivity parameter epsilon/sub req/ is introduced, which is a function of the linewidth to substrate-height ratio W/h. The variation of epsilon/sub req/ with W/h is derived by finite-difference methods. Universal curves for microstrip on correctly orientated sapphire are presented, showing 1) epsilon/sub req/, 2) the low-frequency limit of effective microstrip permittivity epsilon/sub e0/, and 3) the characteristic impedance of the line Z/sub 0/, all as functions of W/h.

❑ Return to main document.