Abstracts

An Accurate, Unified Solution to Various Fin-Line Structures, of Phase Constant, Characteristic Impedance, and Attenuation

D. Mirshekar-Syahkal and J.B. Davies. "An Accurate, Unified Solution to Various Fin-Line Structures, of Phase Constant, Characteristic Impedance, and Attenuation." 1982 Transactions on Microwave Theory and Techniques 30.11 (Nov. 1982 [T-MTT]): 1854-1861.

The analysis of several fin-line configurations (unilateral fin-line, bilateral fin-line, antipodal fin-line, and coupled fin-lines) has been completed accurately. In this unified method, propagation constant is achieved via the generalized spectral domain technique where the basis functions for the bounded and unbounded fields are chosen to be trigonometric functions and Legendre polynomials, respectively. The conduction loss and dielectric loss solution for the first time are found through a perturbation method. The conductor loss so derived is believed to be sufficiently accurate for practical purposes. Characteristic impedances of these transmission lines using tentative definitions have been presented. The CPU time on an IBM 360/65 for calculation of the mentioned parameters does not exceed five seconds if the fourth-order solution in the spectral analysis gives the required accuracy. The programs are also capable of detection of higher order modes.

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