

Investigation of the longitudinal multiconductor transmission line functions for symmetric coupled-microstrip systems

J.G. Nickel and J.E. Schutt-Aine. "Investigation of the longitudinal multiconductor transmission line functions for symmetric coupled-microstrip systems." 2002 Transactions on Microwave Theory and Techniques 50.1 (Jan. 2002, Part I [T-MTT] (Mini-Special Issue on 1999 International Microwave and Optoelectronics Conference (IMOC'99))): 183-190.

In inhomogeneous multiconductor transmission line (MTL) structures such as coupled microstrip, propagation is characterized by multiple quasi-TEM modes with distinct propagation constants. These "mode delays" cause the MTL functions to exhibit longitudinal behavior that superficially appears problematic in the context of passive lossless reciprocal systems. This paper presents a thorough investigation of the longitudinal MTL functions. Using MTL formulation and computer simulation, we explain the mathematics and physics of mode delays so that their effects are not misinterpreted or attributed to error in the numerical analysis of MTLs.

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