Abstracts

A Dispersion Formula Satisfying Recent Requirements in Microstrip CAD

M. Kobayashi. "A Dispersion Formula Satisfying Recent Requirements in Microstrip CAD." 1988 Transactions on Microwave Theory and Techniques 36.8 (Aug. 1988 [T-MTT]): 1246-1250.

A dispersion formula, epsilon*/sub eff/(f) = epsilon* - {epsilon* - epsilon*/sub eff/(0)}/{1+ (f/f/sub 50/)/sup m/}, for the effective relative permittivity epsilon*/sub eff/(f) of an open microstrip line is derived satisfying recent CAD requirements. Closed-form computations with error less than 1 percent compared with numerical solutions are obtained. The frequency f/sub 50/ at which epsilon*/sub eff/(f/sub 50/) = {epsilon* + epsilon*/sub eff/(0)}/2 (the 50 percent dispersion point) is used as a normalizing frequency in the proposed formula, and an expression for f/sub 50/ is derived. In order to obtain the best fit of epsilon*/sub eff/(f) to the theoretical numerical model, the power m of the normalized frequency in the proposed formula is expressed as a function of w/h for w/h >= 0.7 and as a function of w/h, f/sub 50/, and f for w/h <= 0.7. The present formula has a high degree of accuracy, better than 0.6 percent in the range 0.1< w/h <= 10, 1< epsilon* <= 128, and any h/lambda/sub 0/.

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