Abstracts

TE and TM Modes in Circularly Shielded Slot Waveguides

J.L. Tsalamengas, I.O. Vardiambasis and J.G. Fikioris. "TE and TM Modes in Circularly Shielded Slot Waveguides." 1993 Transactions on Microwave Theory and Techniques 41.6 (Jun./Jul. 1993 [T-MTT]): 966-973.

Cutoff wavenumbers and the field of TE and TM modes are evaluated in circularly shielded, single- or double-slot waveguides in case of infinitely thin fins. The formulation, based on field equivalence principles, is exact and leads to Carleman-type singular integral or integro-differential equations for the equivalent surface magnetic current across the slot(s). The solution of these equations is based on Neumann's expansion of the Hankel kernels and leads to numerically stable and efficient algorithms regardless of the slot widths. Numerical results for the cutoff wavenumbers, both TE and TM, are presented. By lowering the cutoff frequencies of the TE modes and by raising the corresponding ones of the TM modes considerable increase in the operating frequency bandwidth may be achieved after suitably selecting the various geometrical parameters of the configurations.

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