Abstracts

Finline Multiport Couplers

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The propagation characteristics of asymmetric and multiple coupled slots in uni- and bilateral finlines are evaluated by using a hybrid mode formulation. All the normal mode parameters of the coupled slot structures required for the design of the multiport circuits are computed. Numerical results include the propagation constants including conductor and dielectric losses, modal characteristic impedances, and the equivalent voltage eigenvector matrices of typical finline structures. These parameters are then used to derive equivalent circuits of the coupled dispersive lines and the expression for the immitance and scattering parameters of the multiports. The applications of the coupled finlines in the design of power dividers and couplers in terms of the normal mode parameters are demonstrated with typical design examples of four and six port structures. Experimental results for an X-band six port are included to ascertain the validity of the theoretical results.

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