Abstracts

Analysis and Design of Microstrip-to-Waveguide Transitions

A wide band, low insertion loss transition from shielded microstrip line to rectangular waweguide is analyzed by the mode matching method and the cascading procedure using generalized scattering matrices. The transition consists of a discontinuity between a ridge waveguide and the microstrip line and a ridge waveguide impedance transformer. The microstrip eigenmodes, including complex modes, are obtained by mode matching method with LSE and LSM mode expansion. The element values of the equivalent circuit for a ridge waveguide step junction is determined from its S-parameters. Computed results of a 17-22 GHz transition agree well with available experimental results. This rigorous approach provides a useful tool for the optimum design of microstrip to air filled waveguide or dielectric filled waveguide transitions.

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