Abstracts

Measurement of Two-Mode Discontinuities in a Multimode Waveguide by a Resonance Technique

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The deliberate use of two or more propagating modes in a multimode waveguide, and a knowledge of associated control elements, has assumed renewed importance, particularly for millimeter wavelength applications. This paper presents a resonance measurement technique for the precise evaluation of the equivalent network for a lossless shunt discontinuity coupling two nondegenerate modes in a multimode waveguide. The discontinuity structure is placed into a cavity closed by adjustable plungers, and the data consists of those plunger positions which render the cavity resonant in the two modes of interest. This multipoint data is then transformed to permit an analysis of the two-port network in the discontinuity plane by conventional techniques. Computations and experimental results obtained at S band illustrative of the procedure are presented for shunt discontinuities coupling the E/sub 01/ and H/sub 01/ modes in circular waveguide. The accuracy achieved is comparable to that obtained in single mode precision measurements.

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