Abstracts

Mismatch Errors in Microwave Phase Shift Measurements

G.E. Schafer. "Mismatch Errors in Microwave Phase Shift Measurements." 1960 Transactions on Microwave Theory and Techniques 8.6 (Nov. 1960 [T-MTT]): 617-622.

The phase difference between the incident and transmitted waves at the input and output ports, respectively, of a two-arm waveguide junction in a reflection free system is a characteristic of the waveguide junction and is defined as the "phase shift." The difference between the phase shift in a reflection free system and the "change of phase" observed in a system which is not reflection free will be termed mismatch error. The mismatch error depends not only on the reflections present in the system but also on the choice of the wave used as the reference wave in a phase measurement. Similar considerations hold for the measurements of variation of phase shift and the observed change of phase in adjustable components. A formal scattering matrix analysis is used to derive expressions for phase relationships of the wave amplitudes for a two-arm waveguide junction in a system with reflections. The results of this analysis are used to evaluate mismatch error for different choices of reference waves. Two techniques of variation of phase shift measurements are analyzed. Graphs of the limits of mismatch error in a commonly used method of measurement are presented.

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