Abstracts

A Novel Approach to the Design of Multiple-Probe High-Power Microwave Automatic Impedance Measuring Schemes

C.-L.J. Hu. "A Novel Approach to the Design of Multiple-Probe High-Power Microwave Automatic Impedance Measuring Schemes." 1980 Transactions on Microwave Theory and Techniques 28.12 (Dec. 1980 [T-MTT] (1980 Symposium Issue)): 1422-1428.

Starting with a modified look at the phasor diagram of a multiple-probe system on a lossless waveguide, one can attain a geometrical method for designing various direct-reading microwave impedance-measuring schemes using fixed probes. This geometrical method will bypass a significant amount of algebraic complexity as encountered in classical algebraic methods. Hence it allows one to visualize the physical picture more clearly and guides one to modify the design more effectively to meet higher performance demands. This article reports a trend of design developments derived from this new point of view. It starts with the analysis of a two-probe system for measuring an unknown impedance /bar z/. This is followed by modifications on the design guided by the new geometrical technique. Finally, two practical designs are derived for measuring an unknown microwave impedance automaticaly. One is to be used under fixed-frequency, swept-power conditions, and the other, under swept-frequency, swept-power conditions. These systems require only inexpensive low-frequency signal processors (either analog or digital) and fixed multiple probes. The output can be either analog with polar display or digital with accurate readouts. To the author's knowledge these designs have not been derived in the past using multiple probes. A critical review on all multiple-probe systems reported in the literature is also discussed with their comparison to the present system.

❑ Return to main document.