Abstracts

A New Method for Six-Port Swept Frequency Automatic Network Analysis (Short Papers)

L. Kaliouby and R.G. Bosisio. "A New Method for Six-Port Swept Frequency Automatic Network Analysis (Short Papers)." 1984 Transactions on Microwave Theory and Techniques 32.12 (Dec. 1984 [T-MTT] (1984 Symposium Issue)): 1678-1682.

Six-port automatic network analyzers measure the reflection coefficient Gamma by means of four power detectors. The amplitude and phase of Gamma are then calculated using the values of the four power readings and the calibration constants at the frequency of measurement. This technique is generally used in a point-by-point measurement method. This paper presents a new method to obtain real-time swept frequency reflection coefficient measurements by using a six-port amplitude chart (SPAC) and a six-port phase chart (SPPC) plotted on a computer screen. The charts are precalculated for each frequency window, which manually (or automatically) scan the test band. Both six-port charts are plotted on the computer screen along with the analog signal from which is measured the modulus and phase of Gamma within the frequency window. This method effectively allows frequency swept measurements of Gamma across the test band. Such measurements are most important for the detection of spurious resonances or for fine circuit adjustments. Once the swept frequency tests of the microwave circuit are done, the usual six-port measurements may then be made at preselected frequency points with the assurance that no spurious response exists in between the frequency test points, and that circuit tuning has been optimized.

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