Abstracts

A Generalization of the TSD Network-Analyzer Calibration Procedure, Covering n-Port Scattering-Parameter Measurements, Affected by Leakage Errors

R.A. Speciale. "A Generalization of the TSD Network-Analyzer Calibration Procedure, Covering n-Port Scattering-Parameter Measurements, Affected by Leakage Errors." 1977 Transactions on Microwave Theory and Techniques 25.12 (Dec. 1977 [T-MTT] (1977 Symposium Issue)): 1100-1115.

The basic philosophy of the through-short-delay (TSD) calibration procedure for two-port automated network analyzers has been extended to n-port scattering-parameter measurements, while also accounting for the errors due to possible signal leakage between all port pairs. The system errors are represented by the scattering response of a 2n-port virtual error network, having n ports connected to the device under test and n ports connected to an ideal error-free multiport network analyzer. The $(2n)^2$ T-parameters of the error network are explicitly expressed in blocks of n^2 at a time, as matricial functions of the $3n^2$ S-parameters of three n-port standards, sequentially replacing the device under test during system calibration. The possibility has also been investigated of correcting the errors due to repeatable measurement-port mismatch changes, typical of switching scattering-parameter test sets. This capability has been introduced and tested in the classical two-port TSD calibration algorithm, by means of a minor modification and data postprocessing, applied after the removal of conventional errors.

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