Abstracts

Phase uncertainty in calibrating microwave test fixtures

Ning Hua Zhu. "Phase uncertainty in calibrating microwave test fixtures." 1999 Transactions on Microwave Theory and Techniques 47.10 (Oct. 1999 [T-MTT]): 1917-1922.

The problem of phase uncertainty arising in calibration of the test fixtures is investigated in this paper. It is shown that the problem exists no matter what kinds of calibration standards are used. It is also found that there is no need to determine the individual S-parameters of the test fixtures. In order to eliminate the problem of phase uncertainty, three different precise (known) reflection standards or one known reflection standard plus one known transmission standard should be used to calibrate symmetrical test fixtures. For the asymmetrical cases, three known standards, including at least one transmission standard, should be used. The thru-open-match (TOM) and thru-short-match (TSM) techniques are the simplest methods, and they have no bandwidth limitation. When the standards are imprecise (unknown), it is recommended to use any suitable technique, such as the thru-reflect-line, line-reflect-line, thru-short-delay, thru-open-delay, line-reflect-match, line-reflect-reflect-match, or multiline methods, to accurately determine the values of the required calibration terms and, in addition, to use the TOM or TSM method with the same imprecise standards to resolve the phase uncertainty.

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